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DECEMBER 1995 / $3.95

MacUser

ZD ZIFF-DAVIS PUBLISHING COMPANY

Windows 95 So What?

It's Still Not a Mac.

PLUS

Multimedia Monitors
Which One's Really Best?

PageMaker 6 Is This The QuarkXPress Killer?

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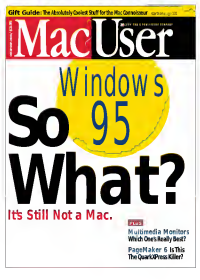
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Windows 95

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ABOUT MICROSOFT'S NEW OS AND WHY YOU SHOULD CARE.

SEPARATE THE FACTS from the considerable hype, and you'll find an operating system current Windows users will love. But is it really as good as the Mac's? We think not, and we'll tell you why.
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Breaking the Speed Limit

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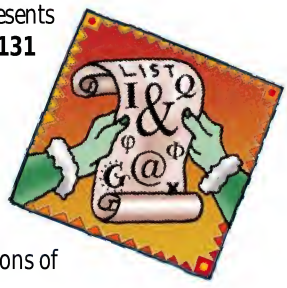
Sight and Sound

MULTIMEDIA MONITORS with built-in speakers are all the rage — and why not? The space-saving aspect alone was enough for us to take a gander. MacUser Labs put seven of these all-in-one monitors through sight and sound checks to find out whether they make the grade. BY NIKKI ECHLER / **116**

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PROBLEM: WE JUST CAN'T KEEP UP with all the great products introduced each month. Solution: Quick Labs, a monthly bulletin of lab results on the latest printers, monitors, and storage systems. / **126**

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and Derek Van Alstyne 1967 – 1989

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SEND PRODUCT INFORMATION to Jason Snell (News), and send new products to Kristin M. Balleisen (Reviews) at MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

LETTERS



Words for Word

JUST WHEN IT SEEMED like most had given up and conceded the battle on Word, Andy's column ("Word's Worth," September '95, page 25) hit and hit hard. "Simpler and better" is a phrase too often lost on software manufacturers today. Thanks for bringing this ideal back into focus.

Tom Brown
MgtGeneral@aol.com

THANK YOU FOR exactly expressing my feelings about Word 6.01. Your brutal, scathing honesty is refreshing in an industry where so many blindly accept and regurgitate corporate propaganda.

Daniel Dissett
ddissett@netcom.com

THANKS FOR your support of Claris MacWrite Pro. MacWrite Pro is as easy to use as you described — it's quick, takes minimal resources, and performs well for importing a variety of other formats.

For serious work, I drag out FrameMaker, which dims the lights when I load it up. But for everyday quickies, MacWrite Pro is the one I use.

Walt Dean
waltdn@aol.com

ANDY IHNATKO must be using a different Microsoft Word 6.01 than I am. As a professional writer, I use Word 6.01 all day long, and I love it! It does everything one could ever ask for in a word processor — and more. Mr. Ihnatko ends his negative column by implying that the ideal word processor provides users with a blank, icon-free screen for uncomplicated work. That's exactly what you get with Word 6.01 — just choose the Full Screen option from the View menu. Maybe Mr. Ihnatko should familiarize himself more with Word 6.01 before criticizing it so strongly.

Mike Murphy
MurphyMM@aol.com

Home Video

THANKS FOR one of the best issues yet. In particular, your article on perfect videos ("Do-It-Yourself Video," September '95, page 68) was timely and instructive. Thanks.

Libby Adams
ladamskc@cyclops.pei.edu

YOUR ARTICLE was helpful and informative, but you did underrate the Quadra 630's video capabilities. Using software other than Apple's Video Player, you can generate frame rates comparable to those of the first AV Macs. Just use Adobe Premiere and Fusion Recorder instead of Video Player.

Eugene Whang
eugene_whang@icafe.com

YOUR COVER STORY sounded great until I read the details. Easy translates to a full day of work for each minute of video. Perfect means a small picture at a slow rate. And affordable means buying a digitizing board and a high-capacity hard drive, not to say a fairly fast Mac.

My own choice has been to opt for linear editing, beginning with S-video and ending with VHS. By the time I learn how to write scripts and shoot video, equipment for digitizing should be able to make truly perfect videos at a more affordable price.

Dennis Fay
DennisFay@aol.com

Code Blue

GREAT ARTICLE on obscure Mac error codes ("Cracking the Error Code," September '95, page 116)! Another good tool for

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c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404
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ILLUSTRATION / MARGARET MCMULLIN

OPEN FOLDER

Plug-and-play has always been one of Apple's strengths, or so we thought. But Glenn Cole warned us via e-mail about something he discovered recently: It seems a formerly Mac-only catalog has begun selling Intel-based PCs. "The catalog includes a table that shows the features of several systems at a glance. One column is labeled 'Plug & Play.' You guessed it — the labels for all the Macs say 'no.'" And that's not all, Glenn: Macs don't come with a sound card, either. What's Apple trying to pull here?

The ferret-savvy among our readership wrote in this month after intrepid columnist Andy Ihnatko tried to pull a fast one in his September column. As reader Geoff Weinberg pointed out, Andy's missing ferret couldn't possibly be of the black-footed variety: "The black-footed ferret is endangered. You must have a sable domestic ferret, which has black feet." Geoff also recommended we educate ourselves by visiting some relevant Web sites. Ferret enough.

Black is in, whether it's the color of your ferret's feet or even your computer. Witness incoming college freshman Michelle Savage, who wrote: "Does the Power Mac 7100/80 come in black?" Sadly, Apple's still committed to the gray look. Maybe it's time to revive the custom-painted-computer business: a new designer Mac just for artistic types, outfitted all in black and sporting a beret; a camouflage CPU for members of the Mac Militia; and of course, a trompe l'oeil Mac for Martha Stewart fans.

Witty banter like this is what makes us what we are today, and readers are noticing. "I can think of no better place to put this than Open Folder," wrote Paul Sutton. "Have you noticed that there are two Apple Newtons? There's Apple's PDA and the snack from the makers of Fig Newtons. Next up: the new Apple Juice, a CD-ROM biography of O.J. Simpson." Paul, because you're a fan of Open Folder, we're going to say this nicely: Leave the joke telling to the professionals, OK?

finding out what the errors mean is the shareware package MacErrors, by Marty Wachter and Phil Kearney.

With this program, all you have to do is type in the error number, and it gives you a description of the error. It's available at ftp://mirrors.aol.com/pub/info-mac/info/mac-errors-121.hqx.

Michael J. Bell
MikeB85105@aol.com

Having a Ball

I COULDN'T AGREE MORE with John Dvorak ("Dropping the Ball, Again," September '95, page 202) about how Apple has failed to market the Mac's advantages. The Mac has sound capability, graphics capability, plug-and-play, networking, speech synthesis, speech recognition, QuickTime, and more. The text editor works with fonts, sounds, pictures, and movies! PCs require a Sound Blaster or other sound card (which is often incompatible with, say, a modem). For that matter, a mouse is often incompatible with a modem.

Andy Lyttle
via the Internet

ONCE IN A WHILE, after I've read through MacUser three times, I flip to the last few pages of the magazine hoping to find an enlightening and interesting piece written by Mr. Dvorak. Unfortunately, he always seems to write in circles. He is undoubtedly the gloomiest columnist writing for your publication. I think he's a spy or perhaps some kind of saboteur working for a PC competitor.

Dvorak is a cool name, though. It even sounds gloomy.

Randy Yñiguez
RanRoc@aol.com

I JUST FINISHED reading John Dvorak's column, and I'm incensed. Not because I think Mr. Dvorak is wrong, but because no matter how hard I try, I can't find a single error in his criticisms of Apple. He's horribly right, and we'd better all hope Apple wakes up and realizes it.

Kurt Tappe
ktappe@omni.voicenet.com

ALTHOUGH JOHN DVORAK complains about Apple's modems, I read elsewhere in your issue about the Apple Color LaserWriter 12/600 PS (Reviews, September '95, page 39). I remember the original LaserWriter, which popularized high-quality graphic output. Now, the Color LaserWriter sounds like it will popularize color output.

Apple isn't good at everything, but sometimes it hits a home run. I can forgive the overpriced hard drives, slow modems, and confusing product families, because the company's strokes of genius make up for the problems.

Scott Schroeder
scott_schroeder@ins.com

Compact Discussion

I WAS DISAPPOINTED with two aspects of "Fast Drives, Loud Speakers" (September '95, page 86). First, you should have included the AppleCD 300e among the 2x drives you reviewed, especially since you recommended it back in December '94 ("Built for Speed," page 76). It would have been helpful to know whether to buy a cheap 2x drive or a 4x drive during this transition period in the technology.

Second, you limited your discussion to the drives and neglected to mention what discs, if any, were bundled. The last time I bought a CD-ROM drive, this was considered a crucial part of the decision. Has this changed?

D. Mark Snellenberger
dsnell@cinti.cent.com

/ The AppleCD 300e is no longer a shipping product, so we couldn't include it among the drives we tested. In general, we don't recommend purchasing a 2x drive — they're roughly the same price as 4x drives and are quickly disappearing from the scene. And the concept of bundling software with drives seems to have fallen out of vogue — only a couple of the drives we looked at included CD-ROMs, and those were mostly demo discs. / CE

Eh, Sonny?

I WAS IMPRESSED that your article on speakers ("Blasting on a Budget," September '95, page 92) went beyond the glitz and straight to sound-quality tests. However, it's obvious by looking at the graphs that these speakers aren't great high-fidelity components. Multimedia speakers are ripoffs! The components included are low-quality, and the speakers are extremely expensive.

If you're after a $40 pair of computer speakers, go to a garage sale and get an old eight-track stereo with inputs. It will have a headphone jack and speakers that should easily outperform the tiny multimedia speakers available in that price range. True, there's no magnetic shielding, but if you're looking for a strong stereo effect, you shouldn't have the speakers a foot away from each other anyway.

Trevor Strohman
tstrohma@theodolite.ae.calpoly.edu

/ Not to mention that with your new stereo, you'll once again be able to play that Cat Stevens eight-track you found in your garage. / JS

Collage Commendation

YOUR REVIEW of Fauve's Xres (September '95, page 56) states, "Another incredibly useful feature is Xres' ability to apply editing operations to multiple objects simultaneously, a capability you won't find in Specular Collage, Photoshop 3.0, Live Picture, or Fractal Design Painter."

Collage does allow you to affect multiple objects for filtering and object manipulation, and it has done so since version 1.0.

Andrei Herasimchuk, Specular International
andrei@specular.com

/ An oversight on our part. We stand corrected. / SJ

Page-Layout Pig

IN YOUR ARTICLE announcing the release of PageMaker 6.0 (DTP & Graphics, September '95, page 98), you failed to mention an important fact: the amount of RAM necessary to run this program: a whopping 10 MB for Power Macs and 8 MB for 680x0 Macs. Ouch!

I've been a loyal PageMaker user for years and years and always try to get the latest release, but that's an awful big chunk of my valuable RAM!

I think I'll stay with version 5.0.

Carol Wolfe
CWCOMET@aol.com

The Resolution Revolution

BRIAN LAWLER incorrectly blames Prof. H. Nyquist for the "2:1 rule" for setting scanner resolution in relation to screen ruling, and he errs in asserting that Nyquist said signal power needs to exceed twice the noise level to be effective ("The Resolution Solution," September '95, page 101).

Nyquist said the minimum bandwidth necessary to avoid crosstalk in a telegraphic

signal is half the pulse rate. In the DTP industry, this seems to get frequently confused with Shannon's Sampling Theorem, published 20 years later. Shannon showed mathematically that a signal can be perfectly re-created by sampling it at twice its highest frequency.

What this means is that you should scan at two times the highest "frequency" in your image — that is, at the highest number of transitions in density per inch.

Chris Lynn
74362.2045@compuserve.com

I WAS THRILLED to see your rule-breaking article. One of my greatest frustrations in working with prepress and other imaging professionals is their marriage to the 2:1 rule. And reminding readers not to use dpi and ppi interchangeably was icing on the cake. Thanks for making my job easier!

Joel Wolfson, Digital Photographics & Imaging via the Internet

TALK ABOUT MAKING a simple process complicated! Your advice was dangerous and overly convoluted.

I live and die by the 2:1 rule, not because I don't know I can get away with less resolution, but because I like the flexibility: I can resize the photo up or down as much as 20 percent in my page-layout program without concern about quality. Also, it is much easier to calculate the resolution you need — most designers are not mathematicians, and giving us a formula such as Q x lpi x % is bound to confuse us and lead us into trouble.

Marc Zeedar
zmarc@designwrite.com

/ As we said in the article, resolution is a controversial subject. Most images do not suffer by being scanned at oversample ratios far less than 2:1, but it's up to you to test the process to determine the ratio that works best for you. Our goal was to get people to think about resolution as a function of making halftones and to arm them with the math — and the concepts — needed to avoid unnecessarily large files. A 250-MB image certainly isn't necessary for a postcard.

One of the biggest problems reported by service-bureau operators is that customers bring in oversized files for output, slowing production, sending costs skyrocketing, and resulting in significant output problems. All of this can be avoided if one pays attention to the correct scanning of images. / BPL

LETTERS

Cross-Platform Rage

I CAN'T TELL YOU how much I enjoyed John Rizzo's "Cross-Platform Myths Debunked" (September '95, page 113). I'm an employee of one such large company that has recently undergone the same fate as the company Rizzo mentions in his article. Having been one of the first people at that company to have a Mac, it really hurts to see so arbitrary a move made by my company.

I sensed a certain rage in John's tone in this article, and I just wanted to tell you that it put me more in touch with my own rage and disappointment with my company.

Paul Bartell
via the Internet

YOUR ARTICLE PROVIDES some interesting and useful tips on adapting cross-platform networks for PCs and Macs, but your advice is severely devalued by the whiny attitude so many Mac users take when making comparisons with PCs. Please, discontinue the practice of whining about PCs. Just give us some legitimate, factually presented solutions to these issues.

Ken Gough
kgough@localnet.com

Modem Down

YOU GAVE the Global Village TelePort Platinum only three and a half mice, but it's worth at least four! Its fax software is superior, supporting grayscale and group faxing, and is PowerPC-native.

The Supra SupraFAXModem 288 does have more indicators, but most home users don't really care about or can't comprehend modem manuals or modem readouts! They want it to be easy to use and to work right out of the box, and that's what Global Village delivers.

Orryan Schriver
orryans@compusmart.ab.ca

YOU SAY THAT "since over half of MacUser readers use Macs and PCs, U.S. Robotics' snub of its Mac customers is less painful than it might otherwise be" (Letters, September '95, page 13). Condoning improper support for the Mac platform is unforgivable, especially from a Mac magazine. It is not a major task to write a simple flash-memory upgrade program for a Mac.

Therefore, the lack of such a program by a vendor clearly indicates that it is not interested in supporting the Mac platform, and we Mac users should steer clear of this vendor and give our business to vendors who do support the Mac market.

If we continue to condone shoddy support for the Mac, we will continue to get it.

Thomas Myers
ITA@aol.com

/ We don't believe that calling a support practice "painful" is the same as condoning it. And, for our money, the quality and performance of U.S. Robotics modems are worth the hassle. You're right about one thing, though: Flash upgrade software is not rocket science, and U.S. Robotics deserves spankies for not making its software Mac-compatible. / RM

Sites & Sounds

I MUST APPLAUD YOU for your article on how to find music on the Internet ("Interface the Music," September '95, page 125). However, you did make one large omission in your list of sites: You neglected the Internet Underground Music Archive (http://www.southern.com/IUMA/index.html), possibly the largest collection of sound and music files on the planet.

Ethan Butterfield
ethanb@hawaii.edu

/ Of course, it's next to impossible to list all the great music sites. We also had to leave out the Musi-Cal searchable concert calendar (http://www.calendar.com/concerts/), a very cool place to find out when your favorite band is coming to town. / SB

CORRECTIONS

Some XChange product prices were listed incorrectly (September '95, page 99). The Photoshop Import XTension is $99. ImageEditor and ImageEfxts are sold together for $129.

The correct toll-free number for Desktop Graphics Services (New on the Menu, September '95, page 36) is 800-391-0681.

The September '95 Quick Labs (page 96) incorrectly listed the Nanao FlexScan FX2•21 as the F2•21.

The correct scanning area of the Epson ES-1200C ("Low-Cost Color Scanners," October '95, page 94) is 8.5 x 11.7 inches.

Brian Clark, Steve Falkenburg, and John Werner should also have been credited for their contributions to Value-Added NewsWatcher ("The 1995 MacUser Shareware Awards," October '95, page 133).

The correct phone number for Wacom (DTP & Graphics, September '95, page 99) is 206-750-8882.

Panasonic PowerDrive² LF-1000AB / New drive doubles as a CD-ROM player and a removable-storage device.

UNLIKELY TOWIN the heavyweight title as either the fastest CD-ROM drive or the highest-capacity removable drive, Panasonic's new PowerDrive² LF-1000AB nevertheless packs a few good punches as a hybrid device. The switch-hitting PowerDrive² works both as a quad-speed CD-ROM drive and as a phase-change optical drive, and with two drives in one, it's more compact than two separate drives would be and uses only one SCSI ID.



Innovative and convenient, the Panasonic PowerDrive² LF-1000AB works as both a CD-ROM drive and a phase-change optical drive, so you get dual functionality at a single SCSI address.

What It Doesn't Do

It's probably just as important to mention what the PowerDrive² does not do as to say what it does. It uses its own proprietary optical media, 650-MB PD cartridges, which cost $59.95 each. It doesn't work with other optical media. It's neither as fast as a SyQuest drive nor as inexpensive as an Iomega Zip drive, and you can't use it instead of a CD-R drive, because only the PowerDrive² can read the PD cartridges. But it's easier to set up and use than a CD-R drive, and you can write to and overwrite the PD cartridges several times.

When you insert a CD-ROM into the PowerDrive² tray, the drive works just like any regular CD-ROM drive. The CD-ROM software that ships with the drive is minimal, consisting simply of a driver and the CorelSCSI Audio utility, which lets you use the drive for listening to audio CDs. The PowerDrive²'s speed is squarely in the middle of the range for 4x CD-ROM drives. You might want to consider adding a third-party CD-ROM program such as FWB's CD-ROM ToolKit or CharisMac Engineering's CD AutoCache to improve its speed.

To use the PowerDrive² as a removable-storage device, you load a PD cartridge (about the size of a CD caddy) into the CD-ROM tray. The cartridge appears as an icon on the desktop. Once you've initialized and configured the cartridge with the bundled CorelSCSI Tools, you can use drag-and-drop to move files to it, as you would to any mounted volume.

The PowerDrive²'s driver software has an annoying quirk: CorelSCSI Tools must be open whenever you mount a cartridge. If it's not, you get a message asking you to initialize the cartridge, as if you'd inserted an uninitialized floppy. But if you try to use the Mac Finder to initialize the cartridge, you'll get a dialog box telling you that the cartridge is locked — whether it is or not. If you want to use the cartridges for automated backup, you will also have to buy a backup application, such as Dantz Development's Retrospect.

Slow but Stable

Writing to a PD cartridge demonstrates both the pluses and the minuses of optical media. Like those of most optical-media drives, the PowerDrive² mechanism does a second pass after it's written data to the cartridge to verify that the data was written correctly. You can turn off the verification, although we recommend leaving it on, because we'd rather have an undamaged backup than a small improvement in speed. In our tests, the PowerDrive² was about as fast as current optical drives; about half as fast as SyQuest, Bernoulli, and Zip drives; and one-third as fast as a Quantum 1-GB hard drive.

Depending on your removable-backup needs, the PowerDrive² is either a bargain or a luxury at today's prices. For the same $995 that buys you the PowerDrive², you could buy a low-end 230-MB optical-media drive and a 4x CD-ROM drive separately. But for those who need 650 MB of removable storage, the PowerDrive² costs less than a high-end 650-MB optical drive alone. And other vendors that will be selling the PowerDrive² under their labels are expected to price it even more competitively.

Panasonic has a strong commitment to the PowerDrive² and has solid plans for its future. The company has an internal model of the PowerDrive² and at press time was finalizing agreements with vendors of Mac-compatible products to offer the PowerDrive² as an option. Panasonic also plans to create a PowerDrive² with a Super Density drive that can read the Super Density CD-ROMs, expected in the near future. They will hold 5, 9, 10, and even 18 GB of data on a single disc. There are also plans for a PowerDrive² jukebox, a CD changer, and a WORM (write-once, read-many) version of the PD cartridge. And in about a year, the Panasonic drive will be competing against a similar CD-ROM/optical-media drive from Sony and Philips, which might spur competitive pricing.

The Bottom Line

As convenient as it is to have both a CD-ROM drive and an optical drive occupying only a single SCSI address, the PowerDrive² is unlikely to usurp the position of SyQuest or Zip drives as an industry standard for removable media because of its cost. But as production ramps up in the coming months, prices for the drive, as well as for its cartridges, will probably drop to more-competitive levels — at the same time as Panasonic keeps it on the cutting edge of new technology. / *Kristina De Nike*

Panasonic PowerDrive² LF-1000AB ★★★½

Price: $995; 650-MB PD cartridge, $59 (list).

Pros: Removable-storage and CD-ROM drive take up a single SCSI ID.

Cons: Slow. Proprietary cartridges.

Company: Panasonic Communications & Systems, Secaucus, NJ; 800-742-8086 or 201-348-7000.

Reader Service: Circle #408.

Merriam-Webster's Collegiate Dictionary

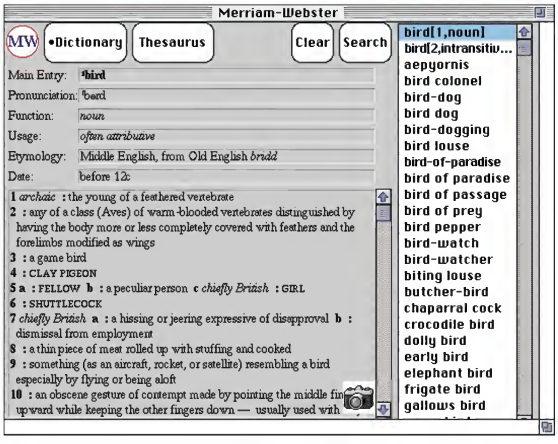
The last word on words.

IF YOU LOVE WORDS — their etymology, their antonyms, and their modern usage — you'll love the CD-ROM-based Merriam-Webster's Collegiate Dictionary, Deluxe Electronic Edition. The 160,000-word dictionary falls short of the 200,000-word American Heritage and 315,000-word Random House electronic dictionaries, but Merriam-Webster more than makes up for it with its informative entries, powerful search routines, and clever word games.

Merriam-Webster's electronic dictionary includes biographical and geographical names, foreign words, and abbreviations. When you look up a word, you get much more than its definition. Separate fields for pronunciation, function, usage, etymology, and date of earliest recorded use bring out the stories behind each word. Synonym and usage paragraphs show you the differences between similar words, and sample phrases and quotations illustrate each word's current use. The dictionary is linked to a 130,000-entry thesaurus. Clicking on the Thesaurus button takes you from a word's definition to its synonyms and antonyms. However, you can't look up a word by double-clicking on it in a document in a word-processor — a feature in other electronic dictionaries and in this dictionary's Windows version. Merriam-Webster says the Mac version will have this feature in a future release.

If you have 28 MB of free disk space, you can install the dictionary and the thesaurus on your hard disk, for fast searches. As with other electronic dictionaries, you can double-click on a word in any field to see its definition and use wildcard characters to find words you're not sure how to spell. But this dictionary's real strength is its unique search capabilities. For instance, you can type 1958 into the Date field to find all the words that were coined that year. You can do multiple-field searches by using AND and OR operators — for instance, you can find all the slang words of Spanish origin. If you enjoy word puzzles, you can use the specialized searches to help you cheat, er, find the word or words you need. You can also do wildcard searches in the pronunciation field to find a list of rhyming words.

The dictionary has a few quirks. You have to click on a camera icon, which sometimes obscures the definition, in order to see an illustration. And the illustrations are indistinct. The online help has useful pronunciation and style guides, but the guides suffer from grammatical mistakes.



In addition to providing definitions, Merriam-Webster's Collegiate Dictionary, Deluxe Electronic Edition, can tell you when a word was first used, find synonyms, and even solve crossword puzzles.

The Bottom Line

Despite a few annoyances, the Merriam-Webster dictionary is a fun and invaluable resource for anyone who works or plays with words. / Aileen Abernathy

Merriam-Webster's Collegiate Dictionary, Deluxe Electronic Edition 1.0 ★★★½

Price: $49.95 (list).

Pros: Links to included thesaurus. Fast search engine. Unique types of searches. Comprehensive entries.

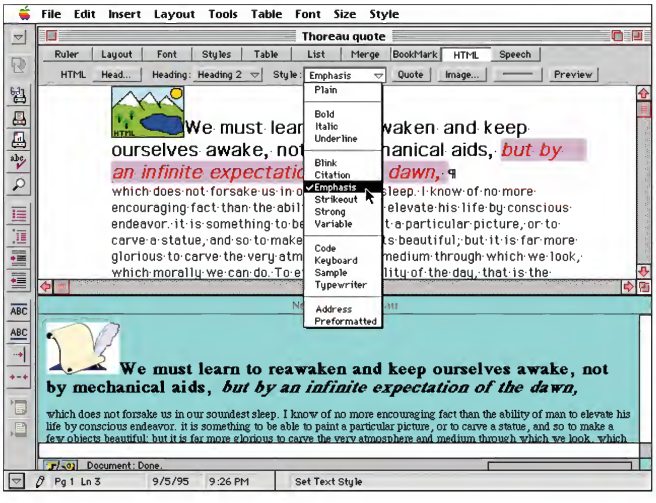
Cons: Cannot define words from within a word processor. Indistinct illustrations.

Company: Merriam-Webster, Springfield, MA; 800-828-1880 or 413-734-3134.

Reader Service: Circle #409.

WordPerfect 3.5 / Novell's stellar word processor gains easy-to-use Internet publishing tools.

TEAMING A HEAVYWEIGHT feature set with an elegant and unobtrusive interface, Novell's WordPerfect is giving Microsoft Word a real run for its money. Ironically, as Word for the Mac has grown more Windows-like in version 6, WordPerfect for the Mac — which began life as a rather poorly disguised DOS program — has become a paradigm for well-designed Mac applications. The latest version of WordPerfect gains an even wider lead over its archrival, with more nimble performance than before, plus the addition of several key features, including new easy-to-use Internet publishing tools.



Create your own World Wide Web pages from within WordPerfect, using version 3.5's easy-to-use HTML tools. Free with the package is the Netscape Navigator Web browser, which lets you preview your Web pages.

Just Browsing

The big news with WordPerfect 3.5 is its incorporation of HTML (HyperText Markup Language), which means you can import HTML documents from the Internet into WordPerfect and edit them or create your own World Wide Web pages for the Net from directly within WordPerfect. You also get free with the package the latest version of the Netscape Navigator Web browser, which lets you preview the HTML pages you create within WordPerfect as well as browse the Net if you're already connected.

WordPerfect makes many aspects of HTML coding, such as background color and pattern selection, a snap — for example, there's no need to calculate funky hexadecimal color codes — simply pick a background color or pattern from a palette. The new HTML bar provides easy access to menus that let you format selected text as headings or as body text, and there's a variety of standard character-level formats you can use, including Emphasis, Strikeout, Strong, and the infamous Blink. Additionally, WordPerfect provides buttons for horizontal lines, quotation formatting, and adding images. To see what your page will look like in a Web browser, you simply click on the Preview button to launch Netscape Navigator (or the browser of your choice) and then load your page. When you're happy with your coding, you save your pages as HTML, and then they're ready for your Web site.

Several other HTML features are provided separately from the HTML bar. If you want to create bulleted or numbered lists, you use WordPerfect's bulleted-list and outline-formatting commands. To link text in a document to other text, either in the same document or in other documents, you employ WordPerfect's new BookMarks and HyperLinks. You can even create links to Internet addresses. When you click on a link to an Internet URL (Uniform Resource Locator), WordPerfect launches Netscape Navigator and passes it the address — very slick.

Creating BookMarks and HyperLinks is a simple point-and-click process. You begin by highlighting the text you want to link to and labeling it as a BookMark. Next, you highlight the text that will take users to the BookMark and define it as a HyperLink. A pop-up menu lets you define your BookMark as the HyperLink's target. When you're done, clicking on the HyperLink text (HyperLinks appear underscored and in a text color of your choosing) takes you directly to the linked BookMark.

I'll Take You There

All the BookMarks you create appear in a handy pop-up menu — select a BookMark, and WordPerfect takes you to the selected text. The pop-up menu even maintains a historical record of all the BookMarks you've visited, including those located on Web pages. When you save a document containing HyperLinks in HTML format, the links become properly formatted HTML anchor tags.

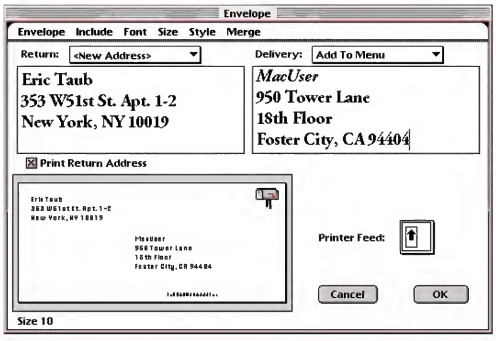
In addition to HTML features and BookMarks, WordPerfect 3.5 includes several other noteworthy additions. Text-to-speech capabilities let you hear either an entire document or a specific selection spoken by one of several Apple system voices. The Print Envelope command provides a nicely designed dialog box that lets you enter addresses or retrieve stored ones into a standard or custom-sized envelope. In addition to typical font and size options, WordPerfect provides a wealth of Postal Service-approved bar-code formats.

The unique Make It Fit command lets you specify how many pages long you want your document to be, and WordPerfect will modify line height and spacing, type size, and margins to make it so. You even have control over what gets modified.

WordPerfect 3.5 ships with two mini-applications, called QuickTasks, that you are able to call up from within the word processor. One QuickTask allows you to import data from Excel spreadsheets, the other from FileMaker databases. The noteworthy thing about this feature is that the data comes nicely formatted in a WordPerfect table.

Smart Templates

The new WordPerfect package is chock-full of template documents — there are more than 80 new ones that range from fax cover



Addressing envelopes is a snap with WordPerfect 3.5's well-designed dialog box.

sheets to business cards to letters. And WordPerfect's templates are more than simple predefined files — they contain built-in macros that prompt you for the information (name, address, and phone number, for example) required to fill in the document. After you have entered the information, the program automatically channels it to the correct location in the document.

WordPerfect also makes it easy to create your own templates, complete with the special macros needed for prompting users for the required information and for placing it in the proper location. To make frequently used templates easy to access, you can place them on the Templates menu under the File menu.

New features aside, WordPerfect's well-designed interface continues to be its most appealing characteristic. It's clean and uncluttered, yet it provides easy access to rich formatting options via various icon bars. You can hide any bars you don't need. Version 3.5 highlights each button or pop-up menu on a bar as you move your pointer over it, which means you don't have to be precise when you click on an item to select it. The one feature we'd like to see that's missing is the ability to collapse a document to an outline and then reorganize it by moving headings as well as subheadings.

Last, but far from least, Novell has slashed the list price of WordPerfect from $395 to $189!

The Bottom Line

With version 3.5 of WordPerfect, a great tool becomes even better. Novell's word processor is quick and responsive, even when it's being run on a lowly PowerBook Duo 230, and the program is no slouch when it comes to features — there's everything from a built-in draw program to automated tables of contents to on-the-fly spelling correction. And the slick new HTML features in the latest release put WordPerfect users directly on the crest of the Internet wave. / Eric Taub

WordPerfect 3.5 ★★★★½

Price: $189 (list).

Pros: Well-designed interface. Robust feature set. Nimble performance. Easy-to-use HTML and HyperLink tools.

Cons: Can't collapse documents to outlines to reorganize them.

Company: Novell, Orem, UT; 800-451-5151 or 801-225-5000.

Reader Service: Circle #410.

Wacom ArtPad II, Wacom ArtZ II, and Summagraphics Summa Expression

Stop mousing around.

IF YOU'RE STILL using a mouse with your graphics program, your system's due for an overhaul. Smaller graphics tablets that cost less than their full-sized siblings have been available for a while, and now there's even more incentive to purchase one. Wacom has improved its ArtPad and ArtZ tablets and lowered their prices. Another new contender is the Summagraphics Summa Expression, but it offers too little, too late.

Each of the tablets comes with a stylus, which gives you precise control over the cursor, making the tablets well suited for graphics work. You can also use the stylus and the tablet to do anything you'd do with a mouse, such as navigate Mac menus, select spreadsheet cells, and highlight text. Each stylus is also pressure-sensitive.

Wacom ArtPad II

The mouse-pad-sized ArtPad is the smallest and least expensive pressure-sensitive graphics tablet you can buy. The latest incarnation has an innovative twist on its stylus: an eraser. The eraser is plastic, and it erases digitally. It's shaped like a pencil-top eraser and houses a spring, so whenever you rub with it, it feels as if you're using a real eraser.

In the graphics applications that support the new digital eraser, whenever you flip the stylus over, the application automatically selects its own eraser tool. When you rub on the tablet with the eraser, the program erases the corresponding parts of your illustration. When you flip the stylus back to its tip, the application returns you to the tool you were using before. Like the tip, the eraser is pressure-sensitive, so the harder you press, the greater the effect you'll get.

Graphics applications that supported the eraser at press time include Adobe Photoshop 3.0.4, Fractal Design Dabbler 1.0a, FutureWave's SmartSketch 1.0, Strata MediaPaint, and the PowerPC-native version of Fractal Design Painter 3.1.

The eraser also works like the Clear command to delete text in applications such as word processors, PIMs, databases, and spreadsheets. You simply highlight with the eraser the characters you want deleted, and when you lift the eraser from the tablet, they disappear.

The ArtPad II's erasing stylus does not employ batteries, so it is light, trim, and maintenance-free. But its lightness also means that you can't trace through a stack of documents more than an eighth of an inch thick. (The battery-powered Summagraphics stylus, in comparison, is able to trace through a stack that's up to three-quarters of an inch thick.) The product would also benefit from two customizable buttons on the side of the stylus instead of one.

With a 4-x-5-inch drawing area, the ArtPad II is unsuitable for tracing anything bigger than a postcard or a snapshot. And it doesn't have any macro buttons on the tablet or as many features as its larger sibling, the ArtZ II. But with a street price that's hovering around $150, it's a terrific deal for children and people who simply want to doodle.



The best inexpensive drawing tablet is the Wacom ArtPad II (bottom). The Wacom ArtZ II (top) costs more, but it gives you a larger pad and more features. The Summagraphics Summa Expression (left) gives you a drawing area the same size as the ArtZ II's, but it falls short of the Wacom tablet in features.

Wacom ArtZ II

If you want an erasing stylus and a slightly bigger, but still inexpensive, tablet that has more features, check out the ArtZ II. For about $330, you get the stylus as well as a 6-x-8-inch drawing area, a clear-plastic overlay to hold drawings in place for tracing, and a menu bar accessible right on the tablet. It has a large border that is wide enough for your hand to rest on it when you're drawing.

The on-tablet menu bar is a new feature in the ArtZ II. The menu bar has 2 buttons that let you adjust pressure sensitivity as well as 16 customizable buttons, to which you can assign keystroke combinations or macros that you write with a macro program. Nine of the buttons are already preset to do common operations such as cut, copy, and paste, but their labels are small and difficult to read.

The ArtZ II also has advanced customization options, which you access on its control panel. You can set a preferred pressure range, so, for instance, the stylus can produce proportionally thicker lines when you press harder than it would with its normal sensitivity. You can set different ranges of pressure sensitivity for different applications too.

The ArtZ II stylus can sense the angle at which you're tilting the stylus tip or eraser so that applications can translate that information into appropriately broader or thinner strokes.

Summa Expression

The Summa Expression stands out for having controls directly on the tablet, instead of having them hidden in a control panel, for setting up a zip area. A zip area allows you to map the entire screen to a smaller portion of the tablet, so you'll be able to

navigate quickly when you need to.

But at roughly the same size and the same price as the ArtZ II, the Summa Expression gives you fewer features. The tablet has only six customizable buttons, preset to match your first six function keys; if you want to customize them, you have to make use of a macro utility. The drawing area's border, which is decorated with an offbeat design, is uncomfortably small. You can adjust pressure sensitivity, but you can't create different settings for different applications and the stylus doesn't have tilt sensitivity.

The heavier, wider stylus requires a battery, which can be problematic if the battery dies late at night in the middle of a project. If the Summa Expression stylus's two customizable side buttons or the ability to draw through thicker layers than with the Wacom styli have you considering the Summa Expression over the ArtZ II, you might want to look at the full-featured, similarly sized CalComp DrawingSlate II (see review, July '95, page 44).

The Bottom Line

The Wacom ArtPad II is a terrific mouse alternative, with basic features for control and accuracy in draw and paint packages. For more money, you can buy a bigger tablet with more features — the most intuitive product we've seen is the 6-x-8-inch Wacom ArtZ II. Summagraphics' Summa Expression, on the other hand, doesn't offer as much as the ArtZ II or CalComp DrawingSlate II, reviewed in our last drawing-tablet roundup. / Shelley Cryan

Summagraphics Summa Expression ★★★

Price: $389 (list).

Pros: Heavier pen can trace through thick documents. Pressure scaling and zip features adjustable with on-tablet buttons.

Cons: Awkward tablet design. Only six customizable buttons on tablet, which require writing macros.

Company: Summagraphics, Austin, TX; 800-337-8662 or 512-835-0900.

Reader Service: Circle #411.

Wacom ArtPad II ★★★★½

Price: $174.99; bundled with Fractal Design Dabbler, $189.99 (list).

Pros: Inexpensive. Small. Erasing stylus.

Cons: Too small for tracing. Only one button on stylus.

Company: Wacom Technology, Vancouver, WA; 206-750-8882.

Reader Service: Circle #412.

Wacom ArtZ II ★★★★½

Price: $389.99 (list).

Pros: Highly customizable. Erasing stylus. Large handrest. Tilt-sensitive.

Cons: Some menu labels difficult to read. Only one stylus button.

Company: Wacom Technology, Vancouver, WA; 206-750-8882.

Reader Service: Circle #413.



A Passion for Art / Magnificent museum

A SPECTACULAR CD-ROM, A Passion for Art gives you a look inside the private collection of Dr. Albert Barnes, which includes work by the likes of Renoir, Cézanne, Matisse, and Picasso.

To explore the gallery, simply click on one of seven buttons to virtually walk through the gallery and look at the paintings one by one, examine documents and audio archives, create your own slide show of your favorite works, or go on one of four guided tours.

Art History. If you decide that you want to explore the gallery on your own, you can focus on any work that catches your eye and from there access text that gives you more information about the painting, the artist, and other artworks in that person's portfolio. You can even examine the art more closely by using the zoom and super-zoom tools, to see, for instance, the painstaking pointillist technique Seurat employed in Sunday Afternoon on the Island of La Grande Jatte.

The guided tours are flawlessly presented in a documentary manner, with narration from art-world notables on prominent themes throughout the collection. There's even a tour about Dr. Barnes that describes his rise from poverty to his amassment of what is widely regarded to be one of the world's greatest art collections.



A Passion for Art is a fantastic accomplishment that imparts the magnificence of the works that adorn its walls along with the spirit of Dr. Barnes. / Kristin M. Balleisen

A Passion for Art ★★★★★ / **Price:** $45 (estimated street). **Company:** Corbis Publishing, Bellevue, WA; 206-526-6000 (distributed by Maxis, 800-526-2947). **Reader Service:** Circle #415.

File Genie Pro / Conjuring up a search

NEED TO QUICKLY FIND and retrieve files stored on your many optical discs, floppy disks, CD-ROMs, and other removable media? Duet Development's File Genie Pro is a swift and easy-to-use file-search and automatic-disk-cataloging utility that lets you find files stored on any of your local or removable media.



Your File Is Served. Graphic artists who work with various removable media will find File Genie Pro a real time-saver — it searches and catalogs a medium in as little as three seconds. Once you've found your file, the software prompts you to load the medium it's on, open the file, print it, and even move it to the Trash. Launched via the Finder's File menu, it also lets you initiate as many searches as you want without losing the results of your previous searches. But it unfortunately doesn't allow you to save frequently used searches.

It has other limitations: For instance, search results are limited to the first 500 files File Genie Pro encounters and it can't use more than one criterion in a search. Those who like what File Genie Pro does can instead buy a comparably priced cataloging utility such as Continuum Software's Virtual Disk and use it in conjunction with System 7.5's more versatile Find File utility. / Steve Rubel

File Genie Pro 1.1 ★★★ / **Price:** $89 (list). **Company:** Duet Development, Campbell, CA; 408-559-3838. **Reader Service:** Circle #416.

FontChameleon Starter Kit

Fabulous fonts fast

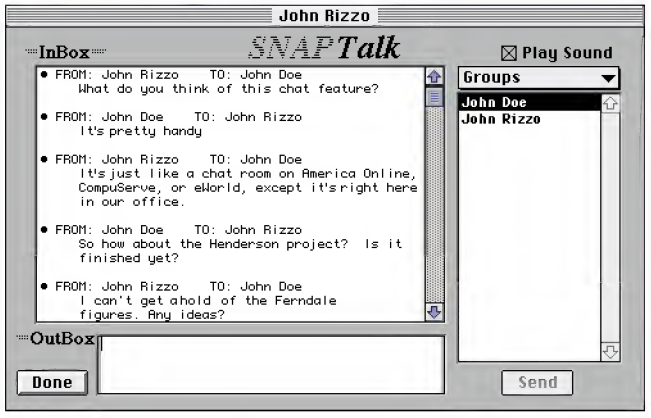
AN ATTRACTIVE alternative to Adobe's multiple-master technology, FontChameleon gives you the freedom to create unlimited PostScript or TrueType fonts by manipulating aspects of a core set of master font descriptors.

Bargain Typefaces. The new Starter Kit edition contains seven font families (Berkeley Oldstyle, Century Schoolbook, Frutiger, Galliard, Helvetica, Helvetica Neue, and Kabel), with 47 typefaces among them. Each font is in the form of a master font descriptor you manipulate with sliders to change aspects such as x-height, descender depth, and weight. FontChameleon then generates PostScript or TrueType fonts based on your settings. Each descriptor takes only about 4K of space, so you can create thousands of fonts without needing the disk space thousands of conventional fonts would take up. After you've created a font, you can save it in its entirety or throw it away and save only its descriptor settings so that you can re-create it. FontChameleon can also create fonts by using commercially available AFM (Adobe Font Metrics) files.

The new version can create true italic fonts, the lack of which was a major shortcoming of the first release (see review, October '94, page 55). Furthermore, the redesigned interface in this version sparkles, with easier-to-use sliders and resizable windows.

You can enhance the FontChameleon Starter Kit with any of four FontChameleon add-on type collections, which cost between $25 and $40 per collection. If you want a more thorough set of font descriptors and typefaces, you can opt for the $295 full edition, which comes with 51 font families, including 220 typefaces in all, and is ultimately a better value for those who can afford it. / Gregory Wasson

FontChameleon Starter Kit 1.5 ★★★★ / **Price:** $55 (list). **Company:** Ares Software, Foster City, CA; 415-578-9090. **Reader Service:** Circle #417.



Snap Mail 2.0 / And e-mail for all

IF YOU NEED an electronic-mail system for your small or medium-sized business, you'll find that the inexpensive and easy-to-use Snap Mail 2.0.2 may have all the features you need — including the option of adding an Internet gateway. Snap Mail is also one of the few PowerPC-native e-mail packages available.

Simple Efficiency. First-time Snap Mail users will be pleasantly surprised by its simple, uncluttered interface. The top part of the main window has the InBox, which lists mail you've received and a directory of users. You select a message and click on the Open button to read it. The bottom part of the window has the OutBox, in which you compose and send messages. You have to be careful how you start the message, however, since Snap Mail doesn't have a subject field and automatically uses the first few words to label your message.

This version of Snap Mail is packed with new features. You can now enclose folders and files up to 15 MB in size by dragging them from the Finder and dropping them into the Snap Mail main window. The new Find function can search through the text of all your messages, and you can store received mail in folders. There is also a Talk button, which lets you confer in real time over your network. The only major feature Snap Mail still lacks is an unsend feature.

Snap Mail can work in peer-to-peer mode, which stores messages on your hard disk that can't be delivered immediately (such as if your recipient is off the network temporarily). However, for this mode, you have to leave your computer on if you don't want to lose undelivered messages.

Alternatively, you can use Snap Mail's distributed server mode, which delivers undelivered mail addressed to unconnected users to a server when you turn off your Mac. You can use a single, dedicated server or distribute server work over several users' machines (which have to be left on). You can also set your computer to always send mail to a server and deliver it from there, which is useful for computers that are often disconnected from the network, such as PowerBooks and computers connecting through ARA.

Get Connected. Snap Mail is a Mac-only product, but the Internet gateway you can buy with it, Information Access Technologies' Hologate, lets you exchange mail with a variety of PC and Mac e-mail systems that also have Internet gateways.

For small groups with networked Macs, Snap Mail 2.0.2 is a great alternative to expensive corporate systems. / *John Rizzo*

Snap Mail 2.0.2 ★★★★ / **Price:** 5 users, $250; 10 users, $420; 50 users, $1,940 (list). **Company:** Casady & Greene, Salinas, CA; 800-359-4920 or 408-484-9228. **Reader Service:** Circle #418.

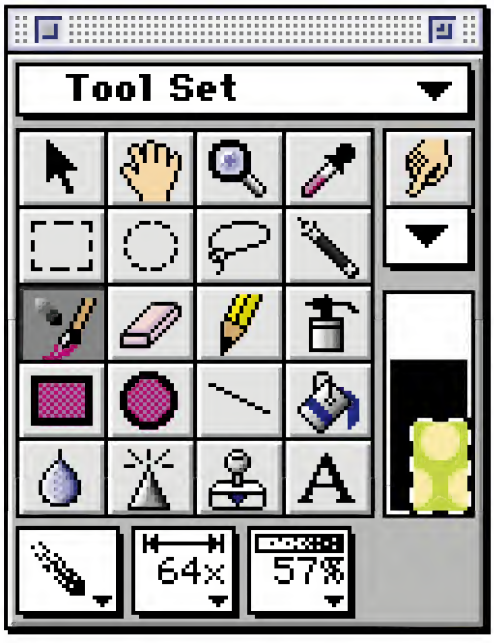
PhotoMaker / Edit images for less

IF YOU LIKED Micro Frontier's Color It! 2.2, which — for a fraction of the price — gave you much of Adobe Photoshop's image-editing/painting prowess, you'll love MacSoft's PhotoMaker. PhotoMaker is Color It!, licensed from Micro Frontier and offered at a bargain-basement price of $29.95. For that modest investment, you get a CD-ROM with PhotoMaker and 100 royalty-free photographic images to play with.

Full of Features. PhotoMaker 1.0 is a slick little program brimming with nifty, user-friendly features. It has a good selection of tools in a customizable tool box (from brushes and airbrushes to smudgers and sharpeners), multiple undo levels, simple and intuitive masking, and support for most Photoshop plug-ins. PhotoMaker's own built-in filters are few but surprisingly useful — especially the Convolution filter, which has most of the power of Photoshop's daunting Custom filter but in a more easily comprehensible package. PhotoMaker does a dandy job of anti-aliasing text against any background, and it has nice select-by-color features that Adobe got around to fully implementing only in Photoshop 3.0.

Quick and Dirty. PhotoMaker is a useful program to have when you need to modify or create an image in a hurry, even if you do have Photoshop. In the time it takes for Photoshop to load, you can be busily painting away in PhotoMaker.

Although PhotoMaker does many things nicely, it's not a prepress or design powerhouse. It doesn't support CMYK or pressure-sensitive styli, and its color-correction tools are limited. Moreover, the overly chatty user guide has some embarrassingly bad screen shots. But it's hard to fault PhotoMaker, given its user-friendly pricing. For those who want to have fun with painting and image editing — but aren't ready for the big-bucks investment required by Photoshop, Painter, and Live Picture — PhotoMaker is a great way to start off. Owners of the aforementioned painting/image-editing heavyweights will also find PhotoMaker a useful arrow to have in their quivers. / Eric Taub



PhotoMaker 1.0 ★★★★ / **Price:** $29.95 (list). **Company:** MacSoft, Minneapolis, MN; 612-559-5140. **Reader Service:** Circle #419.

FreeMail 4.0 / Private roads off the information superhighway



WHEN GETTING friends, family, and clients to communicate with you over the information superhighway is too expensive or difficult, you can create your own private e-mail system, using the innovative FreeMail. Unfortunately, the Mac version is riddled with serious user-interface and documentation defects.

Friends Ride Free. With a single copy of FreeMail, you can create an unlimited number of child copies. These copies, which can't create child copies of their own, require almost no setup, since they come prewired with all the information others need in order to communicate with you.

The standard version lets users with child copies send short messages, up to 400 characters long, directly to you — if you're the person running the original, parent copy of FreeMail — as well as messages to each other, in which case you have to forward them. The more expensive Extended Family version lets users with child copies send longer messages and enclosed files both to you and to each other, without your intervention. The Extended Family version also limits the number of child copies to 200, presumably to limit the volume of mail your computer has to handle. You have to leave your computer on so that it can receive and forward messages.

Misfit Windows. FreeMail was originally written for the Windows platform, and the Mac version seems to have been ported with little revision. Some of the resulting interface problems, such as a button that doesn't line up with other buttons, are minor, but most of them are rather serious. For instance, in both the parent and child versions, some interface elements are completely unreadable on a monochrome screen, which is bad news unless you know for sure that everyone with a child copy has a color screen.

The printed documentation is a Windows manual with haphazard additions for Mac users. You'll need to know Mac equivalents of Windows features to understand instructions that tell you, for instance, to maximize your windows or to press the Alt key. You'll also need to know Windows conventions in order to use the program, such as when a dialog box pops up and asks you whether your floppy disk is in drive A or B.

Oddly, you can't make child disks for Windows, even though your FreeMail network can have both Mac and Windows users. If you have Windows correspondents, you'll have to buy Windows child disks from FreeMail for $5 each.

If you can work around the program's Windows idiosyncrasies on your Mac, you'll find that FreeMail works well: Sending and receiving e-mail is remarkably easy. When the company cleans up FreeMail's interface and documentation for the Mac, as it promises to do in an upcoming version, FreeMail may just be the ticket for creating your own private e-mail system easily and without fuss. / *Michael Swaine*

FreeMail 4.0 ❀❀ / **Price:** $74.95; Extended Family version, $595.95 (list). **Company:** FreeMail, Bozeman, MT; 406-586-4200. **Reader Service:** Circle #420.

APS HyperQIC / Quick and cheap individual backup



IF YOU'VE FINALLY RESOLVED to back up your data every night, check out APS' HyperQIC — a straightforward, rugged quarter-inch-cartridge (QIC) tape drive that can store as much as 4 GB of compressed data on each cartridge. The HyperQIC has decent speeds for individual backup, and at $499.95, it costs considerably less than the average DAT drive, which sells for about $800. The individual HyperQIC cartridges, however, may be too expensive.

Like most other tape drives, the HyperQIC is easy to set up and simple to use. The APS case has switchable DaTerm (digital active termination), which can prevent termination problems on long SCSI chains. The drive comes with Dantz's Retrospect 2.1, the leading archive application for the Mac. APS does not include a tape with the HyperQIC, but they are available through APS and other vendors for $32 to $35 each. The tape, which can hold 2 GB of uncompressed data, comes preformatted and ready to use.

Like It Like DAT. Although the HyperQIC is as fast as the speedy, 28-MB-per-minute Digital Data Storage-2 DAT drive when it comes to throughput with uncompressed data, it does not have hardware compression. If you want to store a full 4 GB of data on a HyperQIC cartridge, you have to use Retrospect's software compression option. With the compression algorithm running on the Mac, the data stream to the tape drive is slower, especially with slower CPUs: With a Power Mac 6100/60, we saw a 20-percent decrease in HyperQIC speed when we turned on software compression.

Because DAT drives use hardware compression, which doesn't affect the drive's speed, and since a DAT cartridge is cheaper than a HyperQIC cartridge (an average 90-meter DAT cartridge costs $8), a DAT drive is a better choice for network backup and for use with gigabytes of data. DAT drives are also much quieter than the HyperQIC.

Built to Last. Although the HyperQIC media and drive are sturdily built, potential users should be aware that the HyperQIC's cartridge sticks out of the drive during operation. A light on the front of the case shows when the tape is in use, but the cartridge is not locked in place and you can therefore pull the cartridge out during a write. If this happens, the tape will still be usable but you will have to start the copy process over again.

The HyperQIC is a small initial investment, it's easy to use, and it's plenty fast for single-workstation backup. If you're careful, you shouldn't have any problems with data security. However, the cartridge prices are too high to make the HyperQIC an economical choice for every office. / Kristina De Nike

APS HyperQIC ★★★½ / **Price:** $499.95; cartridge, $34.95 — $31.95 in quantity (direct). **Company:** APS Technologies, Kansas City, MO; 800-235-2753 or 816-483-6100. **Reader Service:** Circle #421.

TEN FACTS EVERY MAC USER NEEDS TO KNOW ABOUT THE MAC OS'S TOP RIVAL. **By Rik Myslewski**

Windows 95

The smoke from the fireworks has cleared, the stampeders' dust has settled, and the brass band has packed up and moved on. The Windows 95 coming-out party is over, and — like anyone left off a guest list — we Mac devotees may feel a curious mixture of regret and relief: Did we miss something important? Is someone, somewhere, having more fun than we are? Or were we simply lucky enough to have dodged an overpromoted bore?

The answers: yes, no, and maybe. Although it's not the Mac killer that Microsoft would like us to think it is, Windows 95 is a landmark product that affects all personal-computer users — including us Mac folks. And although we're lucky enough to avoid installing it on our desktops, we would be naive to remain willfully ignorant of its importance.

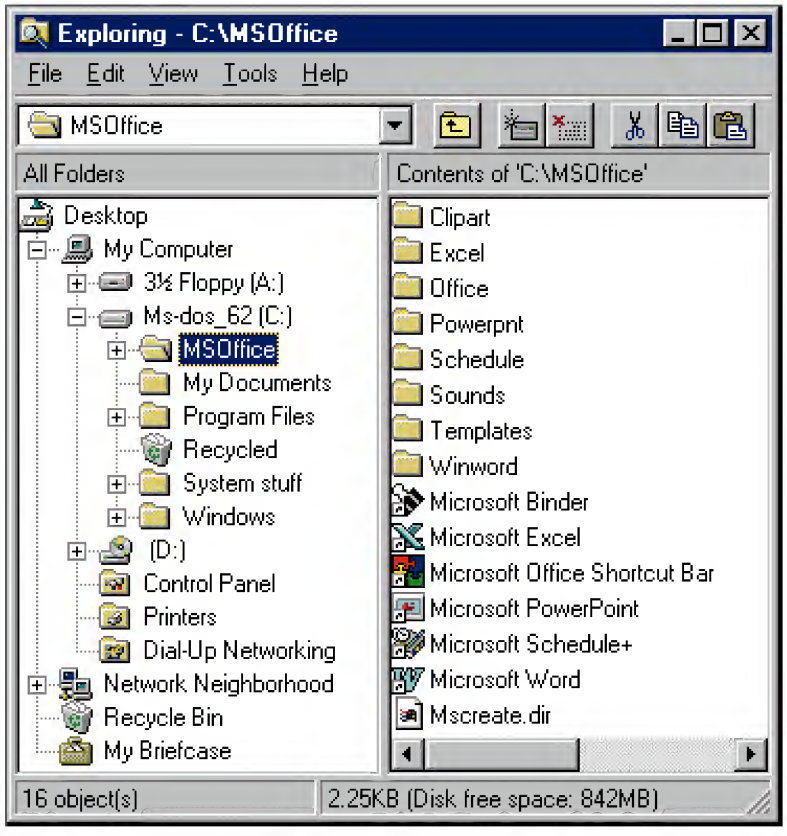
Windows 95 threatens to fool neophytes into believing that a Wintel computer (Windows operating system, Intel microprocessor) is "as good as a Mac." It also strengthens the hand of IS managers who are looking for an excuse to ban Macs from the workplace.

But the Windows 95 user experience (Applespeak for user interface) isn't "as good as a Mac" — not by a long shot. And don't take just our word for it: Read what the PC press has to say (see "What They're Saying . . ."). And as a Mac user, even if you'll never have to worry about your WINSOCK.DLL file being renamed (see Fact 6), you still need to know some basic facts about Windows 95 — if only so you can respond to "It's as good as a Mac" with more than a "Sez who?"

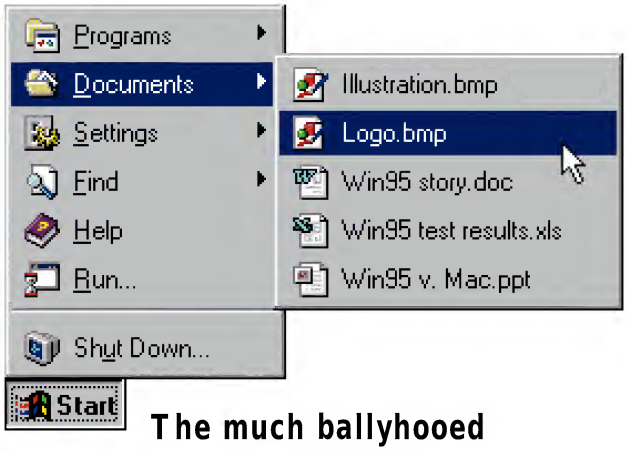
What They're Saying . . .

"Windows 95's look and feel mimics [the] Mac OS . . . but the overhaul is still skin-deep."

— Herb Bethoney and Peter Coffee, PC WEEK



Complex and confusing, Windows 95's Windows Explorer navigation system has garnered complaints from veteran Windows users who long for the simpler — though less powerful — File Manager of Windows 3.1 and Windows for Workgroups 3.11.



The much ballyhooed Start button and its customizable hierarchical menus allow Windows 95 users easy access to applications, utilities, and recently used documents. To our testers, however, the Mac's Apple and Application menus were easier to use than the Start button and its associated Task Bar.

Fact 1. Windows 95 will be a success.

Don't doubt it for an instant. Forget all the hemming and hawing in the popular press. Ignore reports of untold complaints to Microsoft tech support. Disregard the online rantings of disaffected nerds and the cautious pessimism of many corporate IS managers: Windows 95 will sell like hotcakes and will become the dominant operating system for PC-compatible desktop computers.

In Windows 95's first four days of availability, sales topped 1 million copies — astonishing even amid the frenzied hype of August's Windows Week. Projections are that 30 million desktops will welcome Windows 95 by the end of the year. We're talking huge success — and for one very simple reason: need. Windows 95 has the distinct marketing advantage of being a knight-in-shining-armor product — the OS it replaces is a dog.

Fact 2. Windows 95 is an improvement over previous versions of Windows.

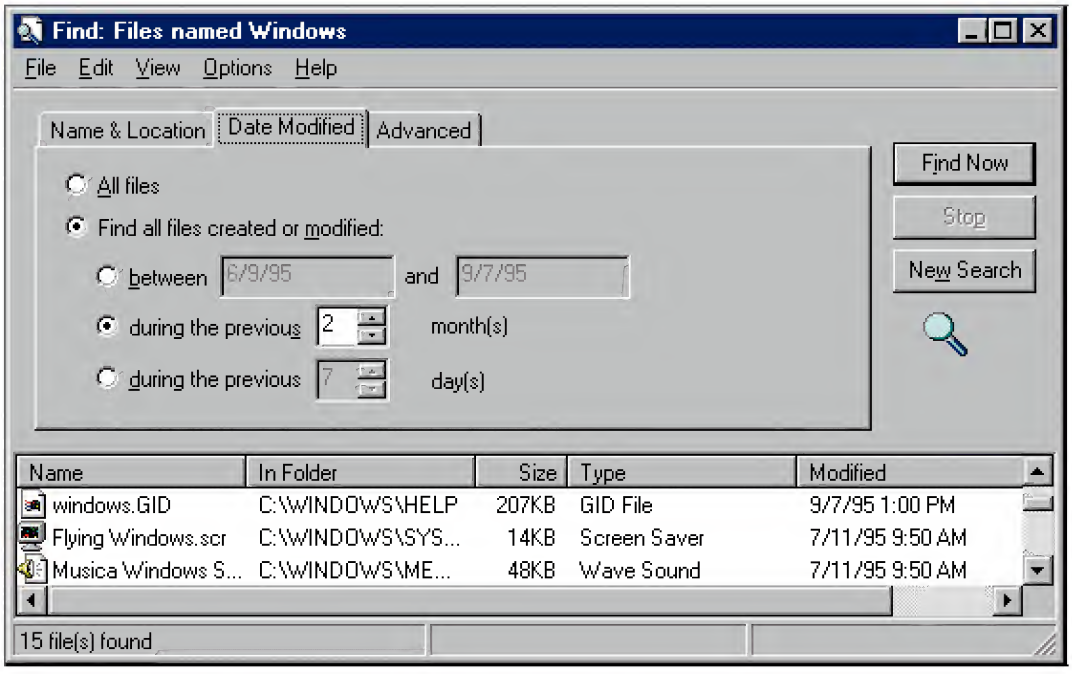
Windows 3.1 and its more robust successor, Windows for Workgroups 3.11, stink. They're hard to install. They're hard to use. They crash a lot. They make it a colossal pain to add hardware.

Windows 95, despite its flaws, is a blessing to Wintel folks. As Apple's advertisements have justly indicated, however, Win 95's biggest innovations are old news to Mac users: long filenames, a trash can (called the Recycle Bin — appropriate for a P.C. universe), aliases (called shortcuts), a real honest-to-goodness desktop, easy switching among applications, and the promise of plug-and-play simplicity (once the peripherals industry implements Microsoft's standards).

Fact 3. Windows 95 is more difficult to use than the Mac OS.

You may be thinking, "It's a Mac magazine. They have to say that." Well, we never doubted it, but one of our sister magazines measured it: When PC/Computing tested Windows 95 in its Usability Lab, novice users rated it poor for managing files and unacceptable for working with applications (they actually preferred Windows for Workgroups 3.11). "Testers were frustrated with even the simplest tasks in Windows 95," was one comment. Furthermore, PC/Computing said, "The carefully controlled Macintosh environment is still the usability standard." Thanks, guys.

". . . if Microsoft had been the innovative company that it calls itself, it would have taken the opportunity to



A full-featured file finder that lets users search by multiple criteria and save complex searches is one of the best-executed aspects of the Windows 95 interface. Mac and Mac-compatible users won't get a utility this powerful until the next version of the Mac OS ships next year — or the year after that.

For many and varied reasons, users find the Mac easier to navigate than Windows 95. For example, take Windows 95's much vaunted Start button and Task Bar. Sorry, but we're underwhelmed: Apple's menu bar, application menu, and Apple menu do the same jobs far more elegantly.

A more specific (and quite typical) example is the Windows 95 "shortcut" for adding an item to the Start menu: Move the pointer to the Task Bar, and click the right mouse button. When the pop-up menu appears, type R (no, it's not listed on the menu, but don't let that distract you — this is a shortcut, remember?). Now type Control-Tab and then A. You'll be presented with a series of dialog boxes that ask you first to enter the name of the item you want added to the Start menu, then to choose where you want to put it, then to type in what you want to call it, and finally to choose what icon you want to represent it. By contrast, if you want to add an item to the Apple menu in the Mac OS, you select it and then choose "Add Alias to Apple Menu" from Automated Tasks on the Apple menu. Done.

Another area where Windows 95 lags well behind the Mac OS is removable-media management. Floppy-drive and CD-ROM-drive icons are always on the desktop — even when no media are inserted. Click on the floppy-drive icon, and you get an alarming dialog box that proclaims, "A:\ is not accessible. The device is not ready." Sure, it's ready, guys. It's just empty. But if you insert a floppy or a CD, the icons don't tell you the name of the inserted disk — they don't even change to let you know that they're now "ready."

Finally, there are the frequent reminders that just below Windows 95's slick surface lurks a soul of pure DOS. For example, each time we restart one of our test PCs in MacUser Labs, we get this warm and friendly DOS-font message: "Invalid VxD dynamic link call from ATR(Ø1) + ØØØØØAA3 to device "3155", service E." Microsoft tech support was baffled, and so are we.

Fact 4. Windows 95 has some advantages over the Mac OS.

But enough Windows-bashing. If you're going to argue convincingly that the Mac remains superior, you'll have to give some ground and concede that there are some ways in which Windows 95 beats the Mac OS.

System administration, for example, is more advanced. Network honchos are positively drooling over two new Windows 95 tools: the Registry and the System Policy Editor. The Registry enables administrators to peek at and tweak individual users' system-configuration information, and the System Policy Editor lets administrators impose standard settings on every PC across the network (or portions of it) — for parameters ranging from available printers and servers to desktop "wallpaper" patterns. These features may sound Orwellian, but they're a godsend to corporate IS managers — and plenty of Mac administrators would love them.

On paper, Windows 95's networking capabilities look awesome. They include support for the industry-standard NetWare and

take a radical leap beyond the Mac, instead of producing a feeble, me-too implementation."

— Douglas Adams, author of The Hitchhiker's Guide to the Galaxy

WHO'S GOT THE EDGE? / dispatches from the operating-system battles

Windows 95 has taken a lot of heat for its (ahem) appropriation of Macintosh interface features, but many of its components put new spins on familiar Mac functions — or introduce altogether new tricks of their own. Conversely, the Mac OS still offers many features that Windows 95 does not (cannot?) approximate. So which OS has the edge — and in what task areas? Here's our breakdown of features — and of which OS has the advantage.

FEATURE	MAC (SYSTEM 7.5.2)	ADVANTAGE	WINDOWS 95
Overall ease of use	Its consistent and intuitive interface remains unequaled.	◀	A huge advance over Windows 3.1 but still labyrinthine.
Customizability	Versatile, but wait for Copland for the big improvements.	◀ ▶	Basic viewing options are well handled.
File management	The Finder is showing its age, but it's still powerful and intuitive.	◀	The Windows Explorer intimidates even veteran users.
Peripherals support	The justly acknowledged leader of no-hassle computing.	◀	Plug and Play is a promising beginning— if the industry plays along.
File searching	Find File will be greatly enhanced in Copland.	▶	A powerful Find command is a must in this Byzantine system.
File deletion	The venerable Trash still does its duty.	◀ ▶	The Recycle Bin: Trash with a trendy name.
Networking	Open Transport is an improvement, but administrative support remains rudimentary.	▶	A rich — if finicky — set of network connections with excellent administrative support.
Online help	Nothing beats Apple Guide's coach marks.	◀	Text-based help is thorough though simple.
Remote dial-in	Apple Remote Access costs extra, but it's worth it.	◀ ▶	A clean interface to a powerful feature.

Microsoft network operating systems and for enough network protocols to satisfy any net administrator's wildest dreams. The vision just gets better when you fold in seamless remote-dial-in support and simultaneous support for multiple networks using multiple protocols — the same multihoming feature that Apple recently added through its Open Transport system extension.

However, as might be expected, the Utopian vision is clashing with reality. Early reports from the field indicate that Windows 95's networking goodies are plagued with incompatibilities that may take quite a while to resolve.

Fact 5. Windows 95 has a more advanced architecture than the Mac OS.

The most powerful advantage Windows 95 has over the Mac lies deep inside. That unmistakable edge is its preemptive multitasking capability. This isn't hype — it's a real boon. In a preemptively multitasking system, the OS takes over the parceling out of CPU time: Background processes can peacefully — and efficiently — coexist, file transfers and disk formatting can take place without tying up the computer, and user interaction can remain smooth and seamless despite multiple background activities. In Windows 95, however, these benefits will appear only when users are running new 32-bit applications written to take advantage of preemptive multitasking; current 16-bit applications cannot run preemptively.

The Mac OS doesn't support preemptive multitasking. What's worse, the next version of the Mac OS, code-named Copland, will support only a limited version, available only to processes that don't require a user interface (file transfers and image rendering, for example). Thus, Mac users will remain behind the preemptive eight ball for the foreseeable future.

Architecturally, the Mac OS has one major advantage over Windows 95: multiprocessing. Specifications developed by engineers at DayStar Digital, and now widely available from Apple, enable developers to write Mac applications that take advantage of multiple processors working on the same task. Windows 95-based PCs can't support multiprocessing.

"Macintosh System 7.5.2 is by far the easiest, smoothest, most usable operating system out there."
— Paul Somerson, PC/Computing

Fact 6. Windows 95 is not fully compatible with existing software.

Compare, if you will, Apple's transition to the Power Macintosh with the Wintel world's transition to Windows 95: Apple offered a rock-solid emulator that enabled Mac users to migrate their existing software with only minor problems. Microsoft created an incompatibility inventory that lists hundreds of applications, utilities, and tools that have some problem with Windows 95. So much for seamless support of legacy applications.

And then there's the case of the missing WINSOCK: Internet users who upgrade from previous versions of Windows and then board the Internet through Microsoft Network or use Windows 95's remote-access features discover that Windows 95 has deftly eliminated their ability to access the Internet through their previous provider. Technically, Windows simply monkeys with the essential WINSOCK.DLL file that instructs the PC where to look for Internet access. Innocent technical glitch — or nefarious roadblock to all Internet on-ramps but Microsoft's? You decide.

Fact 7. Windows 95 will require multiple software upgrades.

If we weren't so darned concerned about conflict of interest (and the watchful people at the SEC), we'd invest heavily in software companies specializing in Windows 95 applications. Like Power Mac users before them, Windows 95 users will have to upgrade their software to take full advantage of their new systems. Windows 95's speedier memory management and greater crash resistance and the multiple benefits of preemptive multitasking benefit only Windows 95-specific 32-bit applications. Hmmm . . . . Thirty million users, a couple of applications per user — looks like a good year for diskette manufacturers, at least.

Fact 8. Windows 95 may require significant hardware upgrades.

Microsoft claims that the minimum hardware platform for running Windows 95 is a 386DX PC with 4 MB of RAM. Sure — and System 7.5 runs fine on a 4-MB Classic. More realistically, PCWEEK Labs' testing proved that no rational human would call the performance of Windows 95 "good" unless it were running on at least a 33-MHz 486DX4 with 8 MB of RAM.

And that's the ground floor: According to testing done by PC Magazine Labs, to make Windows 95's performance really speedy, you would want 16 MB of RAM and a Pentium processor, which takes far better advantage of the additional memory than a mere 486 does. You can almost hear those checkbooks fluttering, can't you?

Most corporate IS managers estimate that Windows 95-fueled upgrade costs for hardware and software will range from $500 to $1,000 per PC. Add to that the cost of training — which, according to usability tests, should remain significantly higher than for the Mac OS. All things considered, you don't have to be a hard-nosed bean counter to question the wisdom of an immediate changeover to Windows 95.

Fact 9. Windows 95 doesn't improve performance.

Windows 95 is a features upgrade, not a performance upgrade. Testing has shown that the performance of 16-bit applications running on Pentium-based PCs remains essentially the same when the operating system is upgraded from Windows for Workgroups 3.11 to Windows 95.

But what about the future? What about when Intel's newest microprocessor, code-named P6, becomes widely available? The news is not promising for Windows 95 users. Although P6 promises blazing speed for fully-32-bit operating systems, such as Windows NT and OS/2 Warp, Windows 95, which contains lots of leftover 16-bit code, won't fare as well. PC Magazine testing suggests that current-generation 16-bit applications running on a P6-based, Windows 95-equipped PC will see practically no speed advantage and may actually run slower than on a Pentium-based PC. And Windows 95-specific 32-bit applications will run about 20 percent faster on P6-based PCs than they do on Pentium-based PCs. Are you unimpressed yet?

On the other hand, expect Mac OS performance to improve significantly when Copland is released. Unlike the current Mac OS, which contains significant chunks of code that must be run in emulation mode on PowerPC-based Macs and Mac-compatibles, Copland will be 95 percent native. Native code plus PowerPC equals a speedy OS.

Fact 10. The Mac is here to stay.

Windows 95 is a much needed improvement over its predecessors. However, it faces significant compatibility challenges, it offers no improvement in speed or responsiveness, it requires a substantial investment in new hardware and software, and — bottom line — it's just plain difficult to use. To paraphrase Senator Lloyd Bentsen, confronting a different well-financed rookie, "I know the Macintosh. I work with the Macintosh. And you, Windows 95, are no Macintosh."

But quality alone is not a guarantee of success. (If it were, we'd all be dubbing quadraphonic sound tracks onto Betamax cassettes of "My So-Called Life.") No, numbers are what count in business, and the PC industry is no exception.

But even if numbers alone are the barometer of success, the Mac is doing quite well, thank you: More than 20 million Macs have been sold. One out of every ten desktop PCs is a Mac. The U.S. Mac market is expected to total well over $10 billion this year — a jump of more than 30 percent from last year.

Then there's one less reported — but possibly even more important — number: This year's Apple Worldwide Developers Conference was by far the most well attended in history, with more than 4,100 in attendance — a 30-percent increase in developer participation over last year. Cutting-edge software will continue to be available for the Mac and Mac OS-compatibles.

The Mac is alive and well.

Rik Myslewski, a veteran MacUser executive editor, says his favorite operating system is still MP/M.

". . . [Windows 95] is relatively easy to crash [and it] retains significant chunks of old DOS code . . . ."

— Linley Gwennap, Microprocessor Report

BREAKING the SPEED LIMIT

RAID LEVEL 0 PROVIDES THE SPEED YOU NEED FOR HANDLING LARGE GRAPHICS AND VIDEO FILES.

By Kelli Wiseth

RAID — the word may conjure up images of late-night gangster movies and Eliot Ness storming into secret hideaways. But although this storage technology doesn't involve moonshine, it may quench your thirst for speed in graphics, video, and prepress environments. RAID systems provide faster access to data than do regular, stand-alone hard drives — you'll especially appreciate the increased speed if you work with large files.

A RAID (redundant array of inexpensive disks) system combines multiple hard drives so that they behave as a single unit. On your Mac's desktop, you see a single volume, but behind the scenes may be anywhere from two to seven hard drives working in unison. It's the old divide-and-conquer approach: Files are split among the drives, as is the workload — the reads and writes occur on multiple physical drives simultaneously, resulting in faster speed than when you use a single hard drive.

There are six levels of RAID — 0 through 5 — for dealing with multiple drives. Five of these levels provide various degrees of reliability, or fault tolerance (see the "Explaining RAID" sidebar). RAID 0 has no built-in reliability features, but it's the fastest level — and it's the focus of our testing, since speed is of the essence for publishing, prepress, and video applications.

For this report, we tested 17 RAID 0 systems — combinations of hard drives, RAID software, and interface cards — in capacities of at least 4 GB. Fourteen vendors are represented, including such newcomers to the Mac market as DPT and xiStor. A veteran of the PC marketplace, DPT is offering its complete line of storage products in Mac versions; xiStor is a recent startup that sells only Mac products. Eight of the systems we tested are for the ultrafast PCI bus, which was recently introduced to Macs in the new Power Mac line; eight are for NuBus Macs; and one, the La Cie Joule RAID, connects to the Mac's built-in SCSI bus.

Among the vendors that are noticeably absent are APS, MegaDrive, Micropolis, and Storage Dimensions. They were in the process of upgrading

PHOTOGRAPHY / MICHAEL LAMOTTE



their RAID systems at the time we did our testing. Some vendors that use products from Adaptec (a leading vendor of SCSI controllers for PCs) did not have systems available at test time, because Adaptec was acquiring Trillium Research, maker of the Remus RAID software (included with many of the products we tested). Trillium Research will become a wholly owned subsidiary of Adaptec and will continue to sell its Remus software to other vendors.

Although we tested only complete systems, do-it-yourselfers can buy drives, SCSI-2 interface cards, and software and build RAID arrays from scratch. RAID software packages such as CharisMac's Professional Storage Suite ($199 list for RAID 0 and 1), Trillium's Remus ($590 list for RAID 0, 1, 4, and 5), and FWB's RAID ToolKit ($399 list for RAID 0 and 1) are the brains behind the software-based RAID implementations we tested.

Only one system — the DPT SmartRAID — is a hardware-based RAID implementation. The other systems include Mac-based RAID software (such as the programs just mentioned), but the SmartRAID includes a PCI SCSI-2 interface card that contains a RAID controller and a 32-bit 40-MHz processor. You'd think that with all the heavy-duty hardware, the SmartRAID would blaze past the software-based RAID systems. But we were disappointed by the SmartRAID's speed — the software-based RAID 0 products beat the SmartRAID hands down in our tests.

THE BOTTOM LINE

TIME IS MONEY — and the fastest RAID 0 array to the finish line can save you a bundle. When rating RAID 0 arrays, speed weighed heavily but we also considered other factors such as price, features, and support. We've separated the PCI products from the NuBus ones to compare the products fairly. Here's how the field panned out.

+ / OUTSTANDING ● / ACCEPTABLE − / POOR

RATING	PRODUCT	PRICE	SUPPORT	FEATURES	SPEED
PCI SYSTEMS					
★★★★½	**MicroNet DataDock Wide Storage System**	●	+	+	+
	BEST BUY — This array ($5,860 list, $5,275 estimated street price) is the fastest system, thanks in part to its dual-channel design. Not only does the system provide top speed but it also comes in a well-designed enclosure, and MicroNet provides customer support 24 hours a day, seven days a week.				
★★★★	DGR Ultrastar 4.0	+	+	●	●
★★★★	MacProducts Magic 4 GB RAID	+	+	●	●
★★★★	Microtech BLUE Streak 3400	●	●	+	+
★★★½	Conley Cobra	●	●	●	●
★★★½	FWB SledgeHammer 4100 FMF-W	●	●	●	+
★★★	CharisMac Anubis 4 GB RAID	●	●	●	●
★★½	DPT SmartRAID	−	●	●	−
NUBUS AND BUILT-IN-SCSI SYSTEMS					
★★★★	**Optima DisKovery 4200W**	●	●	●	+
	BEST BUY — The Optima DisKovery 4200W ($4,155 list, $3,950 estimated street price) uses dual ATTO SiliconExpress IV cards to provide high speed. This overall-best NuBus performer comes with easy-to-use software that also supports RAID 5.				
★★★½	Conley Cobra	●	●	●	●
★★★½	FWB SledgeHammer 4100 FMF-W	●	●	●	●
★★★½	MaxConcept MaxRAID SW4100e	+	●	●	●
★★★½	MicroNet Raven Pro NuBus Wide	●	+	●	●
★★★½	Mirror RAID	●	●	●	●
★★★½	Spin Whirlwind	●	●	●	●
★★★	La Cie Joule RAID	●	+	+	−
★★½	xiStor xi.RAID	●	●	●	−

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

THE CASE OF THE NON-RAID RAID

So just what is a redundant array? In the late '80s, researchers at UC Berkeley were looking for ways around the high cost of the high-capacity hard drives used for minicomputers. The scheme they originally proposed (and documented in a paper with a title reminiscent of a Nancy Drew mystery: "A Case for Redundant Arrays of Inexpensive Disks") consisted of five ways — RAID 1 through 5 — of combining what were at the time relatively low-cost drives (which had lower reliability ratings as well). Since these drives weren't built to the rock-solid specifications of the high-priced storage used in large-systems environments, a key component of the RAID scheme was built-in fault tolerance — data redundancy — which enabled rebuilding of the information on any of the drives in the array if a drive failed.

Until recently, RAID has typically been cost-justifiable for personal computers only in the LAN market, for providing fault tolerance for servers. Interest in RAID for nonserver Macs is being stimulated by such factors as promises of overall speed improvements, particularly for high-end graphics. Due to falling hard-drive prices, new PCI hardware development, and the influx of PCI-card vendors to the Mac market, RAID is fast becoming more viable — read cost-effective — for Macs. The RAID systems we tested start at less than $3,000 — as low as $2,799 for the MacProducts Magic 4 GB RAID.

Although RAID 0 wasn't part of the original Berkeley scheme, it is like the other RAID levels in that it "stripes" data across multiple hard drives. The particulars of striping vary among the RAID levels, and in all cases but RAID 0, either a duplicate of your data or information about that data is also saved to disk — this is the redundant aspect of RAID. Stripes contain the number of blocks of data that can be written (or read) across the entire array; the default stripe size for the products in this review is 64K.

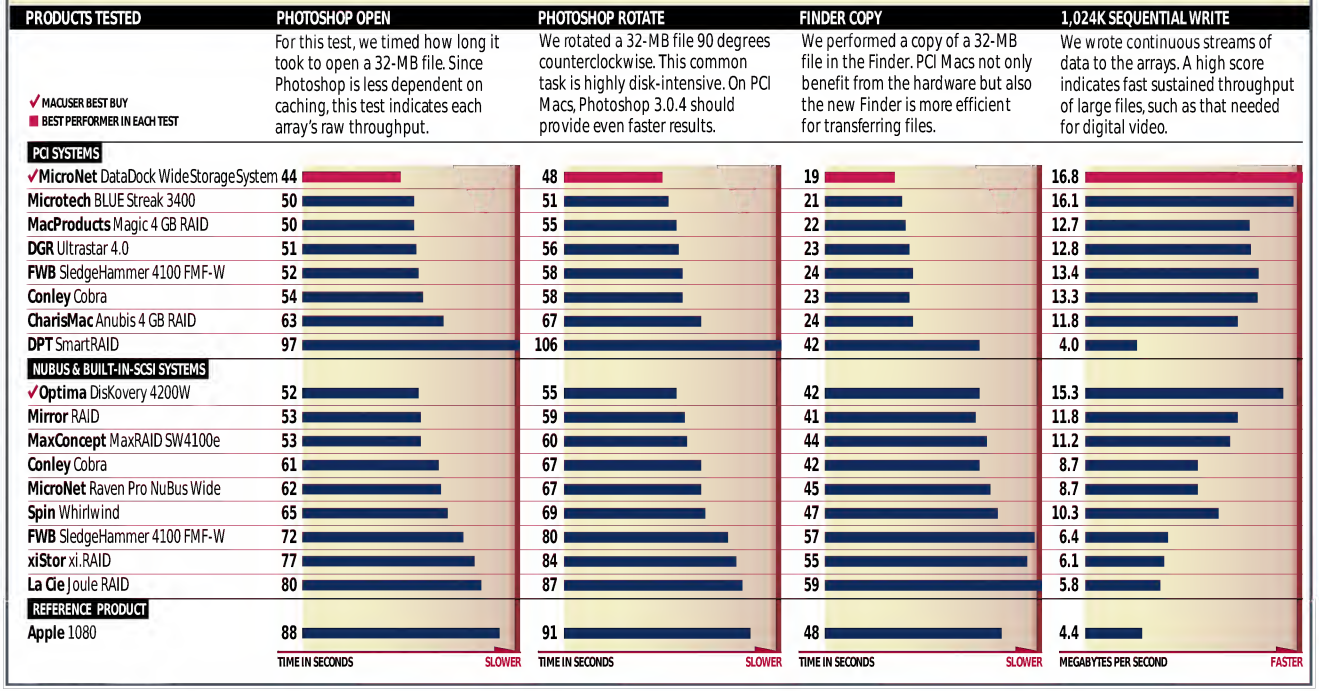
You can see how the speed improvement occurs with RAID if you think about the notion of striping. For example, whereas a single 4-GB drive writes a 64K block of data on a single disk, a 4-GB array composed of four 1-GB drives can simultaneously write four 16K chunks. (The more drives in a RAID array, the faster it is.) When reading files back, splitting the reads among the four physical drives

THE NEED FOR SPEED / the top finishers and the also-rans

Desktop publishers, graphic artists, and video producers can never have too much speed when they're working with large files. Fortunately, a RAID 0 array can cut down on a lot of the thumb twiddling that normally happens while, say, you're opening large files. To compare their speed, we ran the arrays through a series of real-life tests. First, we timed how long it took to open a file in Adobe Photoshop 3.0.1 (Photoshop 3.0.4 was not available at testing time) in order to find out how well each array handled a large data flow. Next, we rotated an image in Photoshop — a time-consuming, common, and disk-intensive task. Our third test, a Finder copy, also tested throughput and let us compare the different Power Mac bus architectures as well as the difference between the Finder that ships with the older Power Macs and the revised one that ships with the Power Mac 9500/132.

We also ran the MacBench 2.0 1,024K-sequential-write test. A high rate signifies an array that offers fast, continuous throughput, such as that needed for processing digital video.

All PCI RAID systems were tested with a Power Mac 9500/132, and all NuBus systems and the La Cie Joule RAID were tested with a Power Mac 8100/80. The arrays are listed here in order of overall speed.



also results in overall faster delivery. RAID 0 doesn't have the overhead of calculating redundant data, so it's the fastest of all RAID levels. Since RAID 0's raison d'être is providing fast data throughput, speed is the most important criterion. We tested each system, focusing mostly on how it performed with high-end graphics applications such as Photoshop and QuarkXPress. We also ran key MacBench 2.0 test suites and a Finder copy (see the "Need for Speed" charts).

NUMBERS RACKET

In addition to revealing the fastest systems, our tests shed light on several factors you should take into account before buying. Without a doubt, PCI provides faster throughput than NuBus, as you can see from our results. For example, we tested both a PCI and a NuBus version of the FWB SledgeHammer 4100 FMF-W (according to FWB, the only difference between the two systems is the interface). Opening a 32-MB Photoshop file took about 38 percent longer on the NuBus system — 72 seconds compared to the PCI version's 52 seconds. You can expect faster results with Photoshop 3.0.4, which wasn't available during testing but is now shipping.

In a production environment, where you may be saving a file every 15 minutes, you'd save about 10 minutes over the course of an 8-hour day, which adds up to a full 40-hour week a year. Although that may not seem like much, consider all the other tasks you may do in Photoshop or any other disk-intensive application — rotating, applying filters, resizing — and your time savings can easily amount to weeks.

Regardless of whether your Mac is NuBus- or PCI-based, make sure the mix of components makes sense: There's little reason to invest in a RAID 0 system if you don't have a SCSI-2 Fast and Wide interface and Fast and Wide drives. This isn't rocket science — it's basic math: A Power Mac's SCSI bus can handle only up to 5 megabytes per second, so attaching a Fast and Wide drive capable of 20-megabyte-per-second throughput is a waste — like slamming your foot on the brakes just as you merge onto the autobahn.

A case in point: Compare the results for the La Cie Joule RAID with those for our baseline storage system, a non-RAID Apple 1080 external drive. Because the Joule RAID also connects to an external SCSI bus and is thus limited to 5 megabytes per second, the SCSI bus becomes the bottleneck, making the Joule RAID fare little better than our baseline drive. At $3,999 for 8 GB of storage, the Joule RAID may sound like a bargain, but you'll be disappointed with its speed.

Hard-drive mechanisms should also support some type of SCSI-2 bus implementation — Fast, Wide, or Fast and Wide. Each of

these has a different bus width and speed. So although the spec for SCSI-2 is 5 megabytes per second, a Fast implementation supports up to 10 megabytes per second; add Wide to this (for 16-bit width instead of 8-bit), and you should see speed increases. With the exception of three systems — the DPT SmartRAID, the La Cie Joule RAID, and the xiStor xi.RAID — the hard-drive mechanisms in the arrays we tested support SCSI-2 Fast and Wide. DPT's mechanisms support Fast but not Wide SCSI-2, La Cie's are narrow Quantum mechanisms, and xiStor's are narrow Seagates.

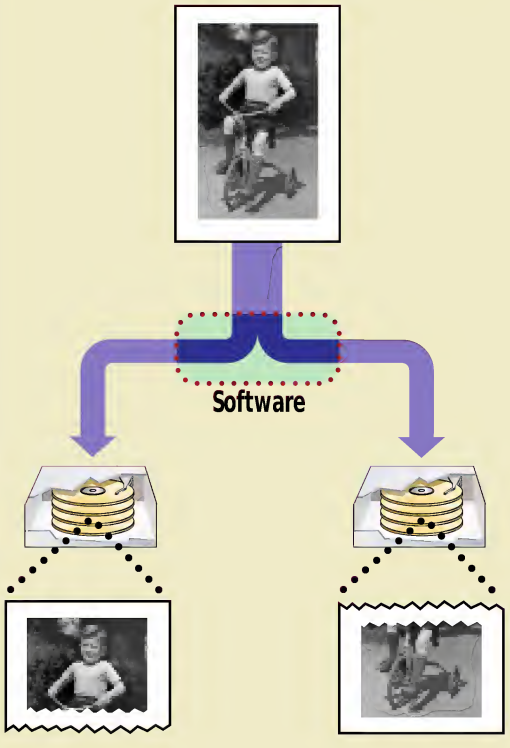
Also be sure the tasks you perform and the applications you use are disk-intensive. In our QuarkXPress test — saving a document as an EPS file — speeds of the RAID systems were either the same as or only 1 percent better than those for our baseline Apple 1080 drive. Since this task involves converting data into PostScript code, it is dependent on the speed of your CPU rather than that of the drives. In cases such as this, where the Mac's processor does most of the work, the money you'd spend for a RAID system would do more good if you upgraded your Mac.

TWO-TIMING BUSES

Two-timers in old gangster movies usually ended up wearing cement shoes, but two-timing (as in doubling up) on the SCSI can really help your system get the lead out. When it comes to SCSI buses and RAID, more is better. Vendors such as ATTO and MicroNet sell (independently as well as part of their systems) dual-channel SCSI-2 interface cards in NuBus as well as PCI configurations. A dual-channel SCSI interface card contains two SCSI controller chips and ports, thus providing for up to 15 devices on each of two separate buses. The advantage of using a single dual-channel card is that you lose only one NuBus or PCI slot in your Mac. Conley ships the MicroNet Raven Pro (a dual-channel card) with its NuBus RAID system, but the system uses only a single channel because of the NuBus bottleneck.

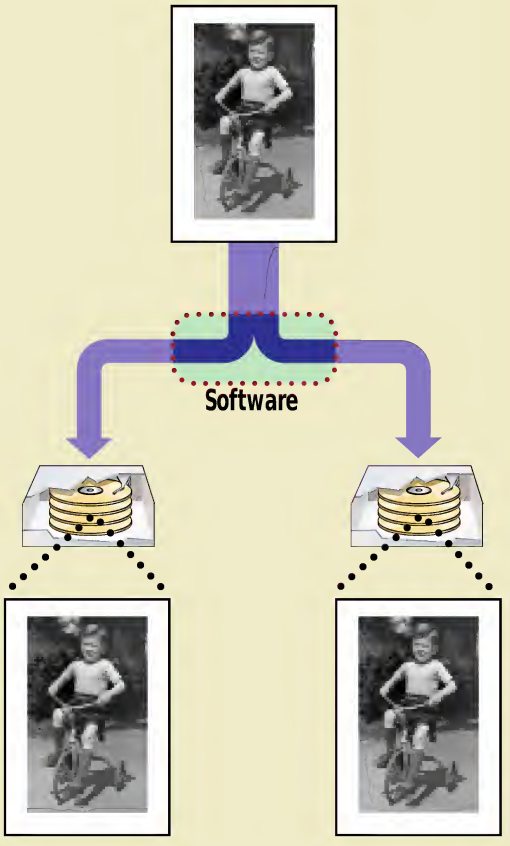
Another approach some vendors take is to bundle two separate SCSI-2 interface cards in the package. The Optima DisKovery 4200W and the Microtech BLUE Streak 3400 each come with two SCSI-2 Fast and Wide interface cards. In terms of pricing, you may

EXPLAINING RAID / what you need to know about the technology



RAID 0

RAID 0 provides the fastest throughput, because it allows a file to be striped — that is, written across two drives. RAID 0 provides the lowest cost per megabyte, because it offers no fault-tolerant features; all the tracks of the hard disks can be used for storing data. Be sure to implement some backup system — if any drive in a RAID 0 array fails, all is lost.



RAID 1

Also known as mirroring, RAID 1 is the most fault-tolerant of the RAID levels, since a second drive contains a complete duplicate of the first. RAID 1 lets you get back to work instantaneously should a drive fail, since you don't have to restore anything. RAID 1 is expensive, because half of your storage is devoted to providing the mirror. Read times are shorter, because more than one drive reads the same file simultaneously, but write times are longer than with RAID 0, because all drives must be written to.

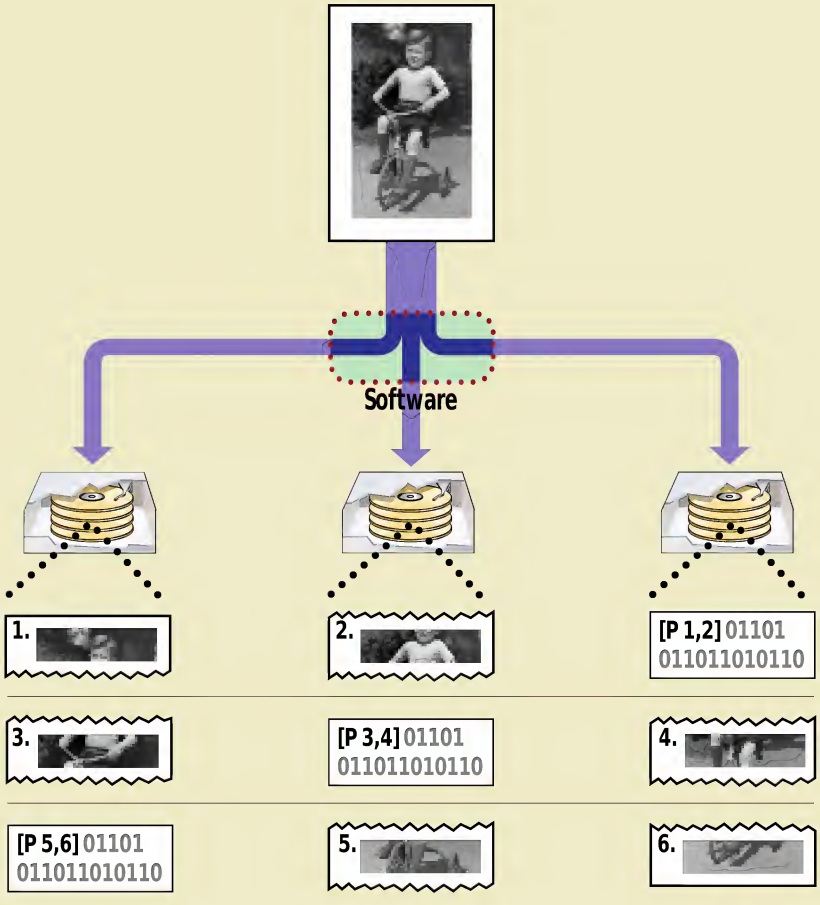
pay a slight premium for the slot-saving convenience of a single dual-channel card. For example, the ATTO ExpressPCI comes in both single- and dual-channel versions; the single-channel ATTO ExpressPCI costs $395, and the dual-channel version is $895. In terms of speed, either a dual-channel card or two single-channel cards will give you better speed than one single-channel card.

In a single-channel RAID 0 system, the physical hard drives are daisy-chained to each other and in turn to the SCSI bus. The dual-channel approach connects one half of the array — which may be composed of multiple physical drives — to one channel and the other half of the array to the other channel, whether the channels are on the same card or on two separate ones.

A dual-channel RAID 0 system is faster, because data is passing through two channels instead of one. In our tests, the NuBus Optima DisKovery 4200W, with its two ATTO SiliconExpress IV cards, was faster on average for the suite of Photoshop, QuarkXPress, and Finder-copy tests than the CharisMac Anubis 4 GB RAID, a PCI single-channel system. If you look at just the results of the Photoshop tests (the most important ones, given the focus of RAID 0), you see that the top five performers overall — the MicroNet DataDock Wide Storage System, Microtech BLUE Streak 3400, MacProducts Magic 4 GB RAID, DGR Ultrastar 4.0, and Optima DisKovery 4200W — were dual-channel systems. Of these, the NuBus Optima system was even slightly faster than the FWB SledgeHammer 4100 FMF-W with a single-channel JackHammer PCI card.

The power of dual-channel systems is exemplified in our 1,024K-sequential-write test. The top three performers — the MicroNet DataDock Wide Storage System, the Microtech BLUE Streak 3400, and the Optima DisKovery 4200W, which are dual-channel systems — were about four times as fast as our baseline Apple 1080 drive. On the other hand, the single-channel NuBus FWB SledgeHammer 4100 FMF-W and xiStor xi.RAID were only one and a half times as fast.

Overall speed is influenced a great deal by the type of files you normally work with. For example, the DPT SmartRAID has been



RAID 5

Best for networks, RAID 5 stripes data across multiple drives, a block at a time; parity information is calculated on a series of blocks and then written to a different drive. If one drive fails, then the file can be reconstructed from any other drive. With parity information as well as data striped across all drives, overall throughput is faster than with RAID 1 (but still slower than with RAID 0).

COST AND NOMENCLATURE aside, RAID provides advantages in two key — and completely different — areas: for networks, where file servers must constantly be up and running, and for graphics and video, which require ever greater speed for accessing and processing large files. RAID 0 through 5 are all about trade-offs: Each level provides a different balance of speed, reliability, and total cost per megabyte. Only RAID levels 0, 1, and 5 are prevalent on the Mac.

optimized to work with small files, and as a result, it fared dismally in our tests involving a 32-MB Photoshop file. The SmartRAID did exceptionally well, however, in the MacBench 2.0 Disk Mix test, a test of key business-productivity applications that is optimized for small, "bursty" reads and writes. Although the Disk Mix test is not a network test per se, the type of read and write activity it models is comparable to that of a file server — bursty reads and writes, typically with small file sizes. We'd be curious to see how the DPT SmartRAID performs in a network environment, but we don't recommend it for desktop publishing or prepress work — connected to a Power Mac 9500/132, it fared worse than the baseline Apple 1080 drive on the Power Mac 8100/80 in all tests except the Disk Mix test.

IT'S A SETUP

Installing and configuring any RAID system takes some time. In addition to the physical installation of the hard drives, the interface cards, and the connections between them, several layers of software are involved, including drivers for the SCSI interface card, drivers for the hard drives, RAID software for striping and configuring the drives, and sometimes management software. Despite this, we had little difficulty installing and configuring most of the systems — although the process was sometimes time-consuming.

The software bundled with all these systems (except the xiStor xi.RAID, for which RAID 1 software costs extra) lets you configure them for at least RAID 0 and 1. Most of the products ship with Trillium Research's easy-to-use Remus Lite, which lets you configure an array for RAID 0 or 1. With the Remus Monitor control panel (and the Remus Responder installed on networked Macs), administrators are able to keep a watchful eye on the status of all the Remus-configured RAID systems.

In addition to striping and mirroring for RAID 0 and 1, Remus lets you configure an array to span multiple disks, which consolidates multiple volumes into a single volume, for easier management. Spanning can be a real boon in a graphics environment or for any desktop littered with numerous, variously sized hard drives.

REMOVABLE BEASTS / the importance of design

IT'S NOT A ONE-SIZE-FITS-ALL WORLD. The systems we tested run the gamut from small, sleek desktop units to tall stacks of drives. Which one you choose depends on your long-term storage strategy. For example, if you think you may eventually implement RAID 1 or 5, hot-swappability — the ability to remove drives without powering down your system — is a feature you'll need. Having removable drives is a prerequisite for hot-swappability, although not all arrays with removable drives support it (see the "Array of Features" table for information on which systems are hot-swappable). Here are your choices when it comes to case design.



REMOVABLE DRIVES

Some arrays consist of a stack of removable drives. You can slip hard-drive modules into and out of docks that contain the SCSI circuitry and connectors. Unlike with standard removable hard drives, however, you can't easily access the data stored on this type of array from another Mac. The second Mac must not only have the correct dock for holding the drives but it must also have the RAID software installed and, for all systems except the La Cie Joule RAID, it must have the proper controller card installed. Some arrays with removable drives do, however, let you hot-swap drives.



EXPANDABLE BUT NOT REMOVABLE

With some arrays, you can expand your storage space by stacking drives in vertical or horizontal configurations. The drives are held together by interlocking clips on the enclosures. These systems do not have removable or hot-swappable drives, but they do let you expand the number of drives in your array without taking up additional desk space. Microtech offers a removable version of the BLUE Streak 3400 for a few extra dollars (we tested the nonremovable version).



ALL-IN-ONE UNITS

These no-nonsense small-to-medium-sized desktop boxes contain the drives that comprise the array in a single enclosure. If you don't plan to make any changes to your RAID configuration, these systems will work quite well. Note, however, that with these all-in-one units, you'll never be able to upgrade to RAID 1 or 5 with hot-swappability. Another drawback is that one drive may fail, but the other may still be good. Replacing the failed drive can be cumbersome. To add more capacity, you can daisy-chain additional drives through SCSI.

AN ARRAY OF FEATURES / sorting out the specifications

There's more than just speed to consider when you're buying a RAID 0 array. The arrays we tested vary not only in speed but also in the features they offer. Some vendors, for example, use removable drives, whereas others use drives that were meant to find a permanent home on your desktop. There's also the issue of cards and channels — do you want a single card, dual cards, or a single card with dual channels? How much capacity do you need, 4 or 8 GB? And the software package bundled with the array is important too — some vendors license packages from third-party vendors, whereas others bundle proprietary software. Vendors also vary in the type of support they offer — for

	LIST PRICE	ESTIMATED STREET PRICE	CAPACITY	RAID SOFTWARE TESTED	SCSI-2 INTERFACE CARD	RAID LEVEL 5	SINGLE CARD	DUAL CARDS
PCI SYSTEMS								
CharisMac Anubis 4 GB RAID	$5,195	$3,995	4 GB	CharisMac Anubis RAID	QLogic Fast SCSI		●	
Conley Cobra	$6,999 (direct)	NA	8 GB	Conley SoftRAID	QLogic Fast SCSI		●	
DGR Ultrastar 4.0	$2,899 (direct)	NA	4 GB	Trillium Research Remus	ATTO ExpressPCI			●
DPT SmartRAID	$7,115	$5,000	4 GB	DPT Storage Manager	DPT PM 3224-MAC with SM4000	●	●	
FWB SledgeHammer 4100 FMF-W	$4,899	$3,700	4 GB	FWB RAID ToolKit	FWB JackHammer		●	
MacProducts Magic 4 GB RAID	$2,799 (direct)	NA	4 GB	Trillium Research Remus	ATTO ExpressPCI			●
✓ MicroNet DataDock Wide Storage System	$5,860§	$5,275	4 GB	MicroNet Power Raven	MicroNet PCI		●◊	
Microtech BLUE Streak 3400	$4,875	$3,645	4 GB	CharisMac Anubis RAID	BLUE Lightning			●
NUBUS AND BUILT-IN-SCSI SYSTEMS								
Conley Cobra	$7,499 (direct)	NA	8 GB	Conley SoftRAID	MicroNet Raven Pro		●◊	
FWB SledgeHammer 4100 FMF-W	$5,099	$4,000	4 GB	FWB RAID ToolKit	FWB JackHammer		●	
La Cie Joule RAID	$3,999 (direct)	NA	8 GB	La Cie Joule RAID	NA (uses Mac's built-in SCSI)		NA	NA
MaxConcept MaxRAID SW4100e	$3,800	$3,540	4 GB	Trillium Research Remus	ATTO SiliconExpress IV		●	
MicroNet Raven Pro NuBus Wide	$5,370	$4,655	4 GB	MicroNet Raven Pro Manager	MicroNet Raven Pro		●◊	
Mirror RAID	$3,999	$2,700	4 GB	Trillium Research Remus	ATTO SiliconExpress IV		●	
✓ Optima DisKovery 4200W	$4,155	$3,950	4 GB	Optima DiskArray RAID	ATTO SilconExpress IV	●		●
Spin Whirlwind	$3,599 (direct)	NA	4 GB	Trillium Research Remus	ATTO SiliconExpress IV		●	
xiStor xi.RAID	$5,560 (direct)	NA	8 GB	ATTO ExpressStripe	ATTO SiliconExpress IV		●	

✓ MacUser BEST BUY
*32-bit bus per channel per card. †8-bit bus per channel. §$5,335 without the hot-swap feature. ◊Dual channels on a single card. **Optional.

Note that you won't see the kind of speed improvement you get when you stripe an array, since with a spanning configuration, writing to the disks that make up the volume happens sequentially rather than simultaneously.

The DGR Ultrastar 4.0, MacProducts Magic 4 GB RAID, MaxConcept MaxRAID SW4100e, Mirror RAID, and Spin Whirlwind are bundled with Remus Lite. The La Cie array also uses Remus Lite, but the software is bundled under the name La Cie Joule RAID. For $295, you can upgrade to the full version of Remus, which gives you RAID 4 and 5 support in addition to support for RAID 0 and 1. Remus' documentation is well thought out and includes tutorials on building various RAID configurations.

CharisMac's Anubis RAID software has the most user-friendly interface — it's simple enough that you don't need to look at the manual. Anubis RAID, which supports RAID 0 and 1, comes with the CharisMac Anubis 4GB RAID and the Microtech BLUE Streak 3400. The Conley systems ship with Conley's SoftRAID — the same RAID software that MicroNet bundles with its RAID systems and that Apple bundles with its Workgroup Servers under their own respective names. It's also easy to use, and the documentation is excellent. SoftRAID supports RAID 0 and 1.

At the other end of the spectrum is the DPT Storage Manager software, which proved to be a disappointment. We were teased by references in several places in the manual to some great features — remote management over both a network and a dial-in connection, for example — only to find that these features were yet to be implemented in the Mac version. The PC version provides numerous low-level configuration settings that can be adjusted to improve throughput, but regrettably, these settings are also not implemented in the Mac version. And although DPT Storage Manager supports RAID 0, 1, and 5 for the Mac, you have to go elsewhere for driver software — it's not included with the DPT system. At DPT's suggestion, we used La Cie's Silverlining, but La Cie confirmed that it does not have a bundling agreement with DPT.

INSURANCE GAME

Once you've configured your system, you shouldn't have to use the RAID software again, unless you need to add to the existing array or change the configuration. And pray that you don't decide to do that with a RAID 0 array, because if you do, you'll have to back up all your data to tape or some other medium and then reconfigure the whole system. You should back up a RAID 0 system regularly anyway — remember that unlike other RAID levels, which are fault-tolerant and enable you to reconstruct your data in the event of a disk failure, RAID 0 does not include built-in recovery features.

You should back up even fault-tolerant RAID systems as well.

example, toll-free tech support and/or five-year warranties.

Without a doubt, sorting out the prices, channels, software bundles, and other features can be harrowing. Our table can help you figure out exactly what each product offers. Check out "The Bottom Line" for our recommendations and ratings.

16-BIT BUS PER CHANNEL	REMOVABLE DRIVES	HOT-SWAPPABLE DRIVES	TOLL-FREE TECH SUPPORT	WARRANTY
●	●		†	2 years
●			●	5 years
*			●	5 years
†	●	●	●	3 years
●				5 years
*			●	5 years
●	●	●		3 years
●	●**		●	5 years
●			●	5 years
●				6 years
†	●		●	5 years
●				2 years
●	●	●		3 years
●			●	2 years
●				1 year
●			●	5 years
●	●	●	†	5 years

Although it might seem "redundantly redundant" to back up a RAID 1 mirrored system or a RAID 5 array, it isn't. Fault tolerance means that the array can recover from damage to one of the physical disks in the array by reconstructing files from the redundant data stored across the remaining disks. If two (or more) disks fail, you're out of luck. Fires, floods, or other acts of nature — a RAID system won't help you overcome these.

CASE CLOSED

The need for speed for DTP, prepress, and video production never diminishes, and using RAID 0 is being touted as one way to increase it. But our tests demonstrated that getting a RAID system is worth the cost only in certain situations. If you've got a PCI-based Power Mac, you'll see a great speed boost when you work with Photoshop files, for example. Any RAID system you get should have hard drives that support Fast and Wide SCSI-2, or you'll be sorely disappointed. Also, RAID systems built around a dual-channel SCSI-2 Fast and Wide card, or two single-channel cards, have an edge over those that use a single channel.

The MicroNet DataDock Wide Storage System is our PCI pick. Its compact enclosure can hold two hot-swappable drives, so you can move the drives to other DataDocks at other workstations. In addition, if you configure the DataDock for RAID 1, the hot-swappable feature will be helpful if one of the drives fails. Better yet, MicroNet offers tech support 24 hours a day, seven days a week.

Although not the fastest in our tests, the DGR Ultrastar 4.0 and MacProducts Magic 4 GB RAID are good buys too. Each took about 40 percent less time than the baseline Apple drive to perform our Photoshop tests. In addition, each company provides a toll-free tech-support number and a five-year warranty.

Among the NuBus systems, the Optima DisKovery 4200W gets the nod. Its two ATTO SiliconExpress IV Fast and Wide interface cards push it a nose ahead of the rest of the pack. Although Optima's standard warranty is only one year, you can extend this to two or three years at an additional cost. And Optima provides cross-ship replacement, meaning that it will send you a replacement unit while you are returning a bum drive. In addition, in case you decide in the future that you need fault tolerance, Optima's software supports RAID 5 (if you have the drives for it). Still, considering how much faster PCI systems are than NuBus ones, graphics and video professionals still working with NuBus Macs might be better off upgrading to a PCI Mac and taking a RAIDcheck.

Kelli Wiseth is a MacUser contributing editor. Senior project leader Kristina De Nike managed the testing for this report.

Perform the same tests as MacUser Labs by using your own copy of MacBench 2.0, available online from ZD Net/Mac. See How to Reach Us for instructions on accessing ZD Net/Mac.

DIRECTORY / vendors of products tested

CharisMac Engineering
Newcastle, CA
800-487-4420
916-885-4420
916-885-1410 (fax)

Conley
New York, NY
212-682-0162
212-682-0071 (fax)

DGR
Austin, TX
800-622-3475
512-892-4070
512-892-4455 (fax)

DPT
Maitland, FL
407-830-5522
407-260-5366 (fax)

FWB
Menlo Park, CA
415-325-4392
415-833-4653 (fax)

La Cie
Beaverton, OR
800-999-0143
503-520-9000
503-520-9100 (fax)

MacProducts USA
Austin, TX
800-622-3475
512-892-4070
512-892-4455 (fax)

MaxConcept
San Diego, CA
800-622-3475
619-530-9062
619-530-9032 (fax)

MicroNet Technology
Irvine, CA
800-800-3475
714-453-6100
714-453-6101 (fax)

Microtech
East Haven, CT
800-220-9488
203-468-6223
203-468-6466 (fax)

Mirror Technology
Edina, MN
800-654-5294
612-830-1549
612-832-5709 (fax)

Optima Technology
Irvine, CA
714-476-0515
714-476-0613 (fax)

Spin Peripherals
Marlborough, MA
800-466-2900
508-787-1200
508-787-1201 (fax)

xiStor
Reno, NV
800-947-8671
702-824-7777
702-825-3016 (fax)

SIGHT and Sound

MONITORS WITH BUILT-IN SPEAKERS ARE THE LATEST FAD. SHOULD YOU INVEST?

By Nikki Echler

Image is everything. That used to be the philosophy when you wanted to buy a monitor. But that was when monitors were supposed to be seen and not heard. Sure, image quality still counts, but with the advent of multimedia monitors (monitors that have built-in speakers), you've now got to worry about whether a monitor sounds as good as it looks.

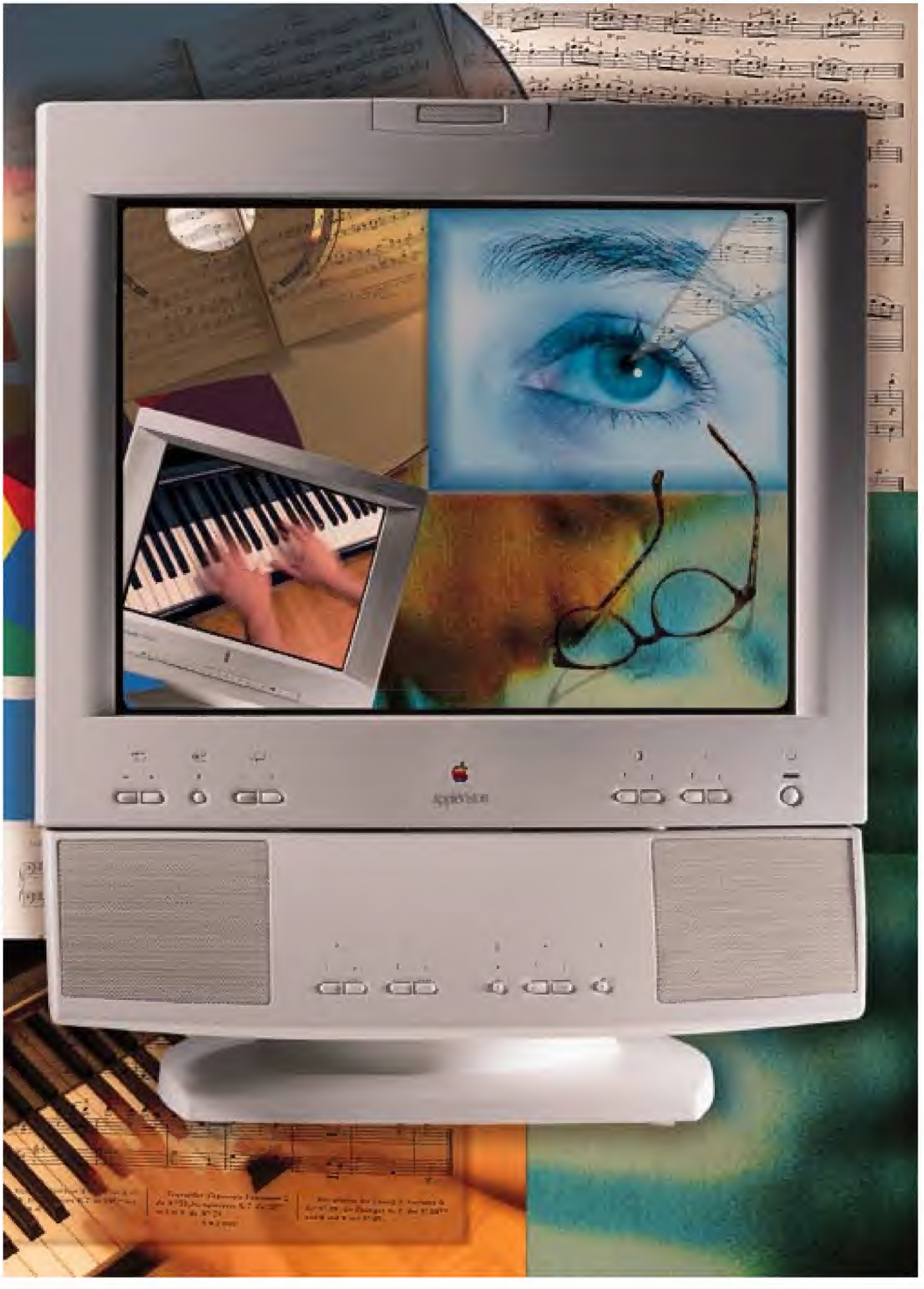
Multimedia monitors have started to show up just in time for the Christmas buying season. Vendors claim that built-in speakers will one day be mandatory for monitors, that the Mac's tiny speakers will not be sufficient when audio applications such as videoconferencing and telephony become commonplace. Right now, however, multimedia monitors are more of an oddity than a must-have.

As of early September, only seven Mac-compatible multimedia monitors were shipping. Of those, only the AppleVision 1710AV represents a second attempt by a company to produce a mainstream product. (Apple's first multimedia monitor, the AudioVision 14 Display, which shipped in mid-1993, lacks the extensive sound and color-calibration capabilities of the newer model.) The other monitors are first-generation products, from companies just starting to tap into multimedia technology.

To get a better idea of whether multimedia monitors are a good idea or just a passing fad, we tested the units that were available in late summer. We were curious about all sorts of things. How does the image quality compare to that of speakerless monitors? How good is the audio? Do vendors charge a premium for the sound capabilities? Do these monitors offer the features we've come to expect from top-notch products?

To answer these questions, we spent considerable time with each monitor. We performed lab tests on image quality and sound quality; we stared at text documents, line art, and scanned images; we played our favorite audio CDs at office-hours levels and at after-hours levels; we fiddled with knobs and on-screen controls; we checked street prices and warranties. You get the picture. Here's what we learned.

PHOTO ILLUSTRATION / GIAMPIERO BENVENUTI



THE PROS: WHY YOU'LL LIKE THEM

It didn't take long to find a couple of good reasons to at least consider purchasing a multimedia monitor. First, these monitors generally cost only a tad more than their speakerless counterparts, and second, even the worst-sounding units had better speakers than those built into the Mac. Beyond that, we found several distinct advantages that multimedia monitors offer.

Built-in speakers take up less desk space than stand-alones — a valuable trait in a world where desktop real estate is at a premium. Even better, built-in speakers won't get knocked over nor will they just "walk away." Expensive stand-alone speakers may offer jazzy looks, top-notch sound quality, and easy portability, but these very attributes can work against them, making them prime targets for theft. On the other hand, swiping a multimedia monitor to get at the speakers would be like stealing a house to get at the safe — it just doesn't make sense.

Some users will be charmed by a multimedia monitor's no-assembly-required approach. Unlike many personal stereo systems, an all-in-one system doesn't leave you with a mass of flimsy speaker wires tangled up around your desk nor does it give you any setup headaches. For example, with a multimedia monitor, you don't have to worry about matching the speakers' RCA plugs with a computer's standard stereo miniplug. Instead, you simply attach a short cable that comes with the monitor directly between the Mac's audio-output port and the multimedia monitor's speakers. This no-fuss approach is sufficient for those who want a quick-and-easy way to get better sound than what comes out of the tiny speakers in their Mac. True audiophiles, however, might be left wanting more.

THE BOTTOM LINE

SILENT NO LONGER: These monitors have a voice, but at what cost? Before buying a monitor with built-in sound capabilities, be sure to compare prices with its speakerless counterparts. After you've checked out the price tag, turn up the volume, take a long look at the screen, and play with the buttons. After all, a good multimedia monitor is more than just a pretty picture.

+ / OUTSTANDING ● / ACCEPTABLE − / POOR

RATING	PRODUCT	PRICE	SUPPORT	IMAGE QUALITY	SOUND QUALITY
★★★★	ViewSonic 17GA	●	●	+	●
★★★★	Apple AppleVision 1710AV	−	●	+	+
★★★½	IBM 17S/S	−	●	●	+
★★★½	Nokia 447W	●	●	+	−
★★★½	Panasonic PanaMedia 17	●	+	●	●
★★★	Philips 17B	●	●	●	−
★★½	Philips Brilliance 15A	●	●	●	−

ViewSonic 17GA

BEST BUY

A real multimedia bargain, the ViewSonic 17GA (estimated street price, $850) offers solid image quality, warm colors, fine-sounding audio, and a slew of easy-to-use on-screen controls — all at a competitive price. The stylish case will also make you the envy of your office mates.

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

THE CONS: WHY YOU WON'T LIKE THEM

Even the vendors of multimedia monitors will tell you that built-in speakers will probably never match the sound quality of a home stereo system. Cost issues aside, physics works against including high-quality sound in a monitor. First, the speakers that fit in a monitor are not big enough to produce the full range of sound you can find in a home system. Large speaker cones and enclosures produce deeper, richer bass response than their smaller counterparts, because they can move more air and create deeper reverberations.

Second, it's difficult to acquire surround-sound from stationary speakers. Home-stereo enthusiasts plan speaker placement carefully so that the sound waves bounce and reflect for optimal audio. Monitor speakers, however, don't allow you this luxury.

Finally, large speaker magnets create loud, rich sounds but their magnetic forces can also cause color distortion in your monitor. Manufacturers use special shielding on all computer-compatible speakers to keep them from interfering with the monitor's screen image, but this shielding is not strong enough to protect a monitor from the pull of large speaker magnets.

Because of these technical issues, audio enthusiasts may be disappointed by a multimedia monitor's limited sound capabilities. You won't get booming bass lines, surround-sound, or home-stereo-level loudness from any of today's multimedia monitors. Serious music fans will have to shell out extra cash for stand-alone speakers in order to experience audio authenticity.

Graphics professionals may also hesitate before jumping onto the multimedia-monitor bandwagon. None of the monitors we tested had a screen size larger than 17 inches, and only the AppleVision 1710AV and the Nokia 447W offered any color-calibration abilities. The AppleVision 1710AV's software can create a ColorSync profile, which you can refine by adjusting the screen's white point, ambient light, and gamma point so that the display matches real-life colors. New color-management technology also allows the AppleVision 1710AV to constantly monitor and correct for the effects of ambient lighting, phosphor aging, and glass browning, so that on-screen color remains accurate over time. Nokia supplies its monitor with Colorific, color-calibration software that works in conjunction with ColorSync 2.0 to enable you to match on-screen colors with their printed counterparts. Nonetheless, with so few color-calibration choices available, professional designers might be wise to wait until more products reach the market.

HEARING IS BELIEVING

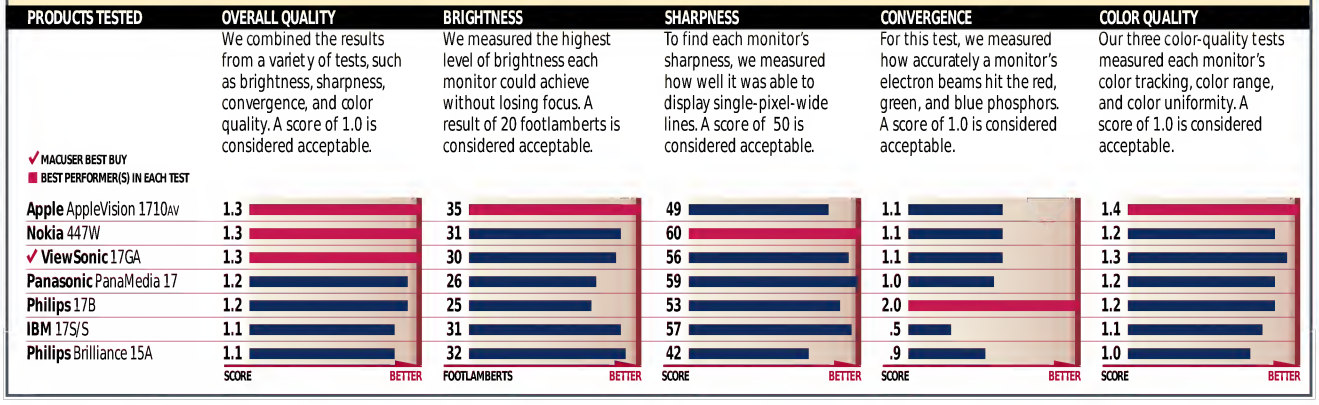
If you're ready to take the plunge and buy a monitor with built-in sound capabilities, you should listen before you leap. We performed objective lab tests to find out how well each monitor reproduced sound. Then we tested the monitors the old-fashioned way, simply listening to a wide variety of sounds. Audio quality ranged from poor AM-radio-style crackle to sound reproduction that held its own against inexpensive stand-alone speakers.

Speaker location has a strong influence on audio quality. Monitors that have speakers hidden underneath the bezel or relegated to the sides of the case, such as the Nokia 447W and both of the Philips models, sacrifice volume and clarity as the sound waves are absorbed by the desktop or dispersed to the side. To achieve superior audio, the speakers should be mounted on the front of the monitor,

LOOKIN' GOOD / multimedia monitors provide solid image quality

We're a tough crowd to please here at MacUser, but we didn't find much to complain about when it comes to image quality. Overall, all the monitors gave us clean, colorful images. In fact, we noted failings only in the brightness tests (the Panasonic PanaMedia 17 and the Philips 17B were noticeably dim) and in the convergence tests (the IBM 17S/S showed visible halos).

In order to test image quality, we ran the monitors through a gamut of lab tests, using sophisticated measuring devices. A spot meter gave us data on each monitor's brightness, sharpness, convergence, and geometry. A color analyzer revealed how well each monitor fared when reproducing color: It measured color tracking, color range, color uniformity, and color purity.



so that the sound waves travel in a direct path to your ears.

In fact, the AppleVision 1710AV, IBM 17S/S, Panasonic PanaMedia 17, and ViewSonic 17GA each have the speakers on the front of the bezel — and these monitors scored above average in our subjective listening tests. Of these, the AppleVision 1710AV, with its relatively high-powered speakers bulging up and out from the bottom front of the bezel, blasted past the competition in terms of pure power and accurate sound reproduction. No other multimedia monitor came close to matching its extensive bass and treble response; the resulting sound was clean and sharp enough to rival that of the stand-alone Altec Lansing ACS52 speakers we used for comparison.

One explanation for the AppleVision 1710AV's superior sound lies in its design. Like the Altec Lansing ACS52 speakers, the AppleVision 1710AVs gain greater bass-tone reproduction through porting, a technique that allows air to pass through the enclosure and causes the speaker cones to reverberate. The rest of the speakers, which lack this feature, offered only minimal bass response (see the "Sounding Off" charts).

The IBM 17S/S performed slightly better than the Panasonic PanaMedia 17 and the ViewSonic 17GA, although all three proved capable of pumping out adequate sound at above-average volume. Each of these units suffered from minimal bass response, but their overall sound quality was far superior to the tinny, scratchy sounds of both the Philips models. We were disappointed with the Nokia 447W's poor sound quality. We also noticed a disturbing trend with the Philips monitors and the Nokia 447W: When we boosted the speakers in these monitors to high volumes, we saw an irritating shimmer on the monitor screen. Speaker vibrations at these volumes were causing the monitors' shadow masks to vibrate.

PICTURE PERFECT

Image quality may no longer be a monitor's sole selling point, but don't be deceived by relatively slick-sounding speakers into thinking that it's not important. Listening to your favorite audio CD may get you through the day, but chances are you'll spend more of your time staring at a spreadsheet than jamming to the beat. To help you determine which monitor offers the best image quality, we ran each through a battery of lab tests and then stared them down ourselves to make sure the numbers didn't lie (see the "Lookin' Good" charts).

Overall, each monitor offered acceptable image quality, but individual strengths and weaknesses may dictate which monitor you prefer. If you work with numbers, for example, you may want the sharpest monitor; if you work with scanned photos, you may need the monitor with the best color quality. Here's what we found.

Brightness. Looking at a dim screen over long periods can place undue stress on your eyes. Thus, it's wise to choose a monitor that's sufficiently bright. You should also make sure the monitor is even brighter than you need — dimness creeps up on monitors as CRTs age over the years, like a receding hairline.

All the monitors we tested offered adequate brightness for most office environments. The AppleVision 1710AV and the Philips Brilliance 15A scored the highest, providing enough brightness to last well into their golden years. Our testers and editors also noted that despite other image flaws, these monitors stood out from their competitors; in general, people have a natural preference for bright screen displays. In comparison, the Philips 17B, which offered the least brightness, proved disappointing and dim.

Sharpness. People who spend most of their day slaving over spreadsheets or staring at word-processing documents will want a monitor that offers crisp text and clean lines. To evaluate screen sharpness, we measured the contrast between adjacent single-pixel-wide black and white lines. The Nokia 447W scored the highest, by a nose, in terms of crisp screen images.

Only the sweet-sounding AppleVision 1710AV and the Philips Brilliance 15A produced unacceptable scores in this test. In each case, text and lines appeared noticeably more blurry than they did on the other monitors. Blurriness has plagued many of Apple's monitors — and the problem is still evident on the AppleVision 1710AV.

Convergence. The sharp, colorful images that pop up on your monitor are the result of electron beams accurately lighting up the red, green, and blue phosphors on the inside of the screen. If these electron beams do not nail the phosphors squarely on the head, you'll see fuzzy, off-color text and color halos rainbowing around the edges of images. Our tests measured the alignment (known as convergence) of these electron beams. Although both the IBM 17S/S and the Philips Brilliance 15A had subpar convergence levels, we noticed only the slightest differences between these monitors and the top-scoring Philips 17B. Most monitors, unfortunately, do not have convergence-correction capabilities.

Color Quality. You don't have to be a graphics guru to appreciate high-quality color. Even inexpensive CD-ROM titles such as Passage to Vietnam or games such as DOOM and Buried in Time sport stellar graphics and vivid, photo-realistic images. If you want the most from your multimedia monitor, don't settle for washed-out colors.

We tested each monitor for color purity, range, and uniformity of brightness across the screen. Imperfections in any of these qualities can result in weak colors, limited hues, or a dirty-looking screen. The AppleVision 1710AV and the ViewSonic 17GA scored slightly higher than the rest of the group in these tests, but the color quality of all the monitors was acceptable. Even when we viewed color quality subjectively, it was difficult to pick out any favorites from the mix, although the AppleVision 1710AV garnered praise for its vivid colors and the ViewSonic 17GA earned points for its realistic hues.

THE PERFECT ALTERNATIVE / the third option

THE IDEA OF AN ALL-IN-ONE, space-saving multimedia monitor is appealing, but you love the monitor you have. What do you do? One option is to check out the Sony CSS-B100 speaker system ($99.95 list), which is designed to fit underneath your monitor.

The lightweight set of full-range audio speakers fits below any 17-inch or smaller monitor. Sliding-bar tuners located between the two front-mounted speakers let you adjust the volume or pump up the bass. In order to obtain a full, rich sound, however, you'll want to keep the bass boosted at all times. (Lowering the bass results in a flat, weak sound that's hardly better than what comes out of your Mac.)

With the volume turned up and the bass maxed out, the Sony speakers prove comparable in sound quality to most of the low-cost personal speakers currently being manufactured for use with computers. The Sony CSS-B100s also compete with personal speakers for features. They ship with all the necessary cables, and the front-panel input ports make hooking up headphones, a microphone, or an additional CD player a breeze. You can reach Sony at 800-352-7669 or 408-432-0190.



Other vendors, such as NEC, have also realized the value of space-saving sound systems and will offer similar below-the-base speakers this fall. As sound quality improves and desk space lessens, these stackable speakers may become the perfect audiovisual alternative for tight spaces.

EXTRAS AND ERGONOMICS

You might not buy a car solely because it has dual air bags, but the extras that come with a product can, and should, influence your final purchasing decision. Computer monitors are no different. We put together a wish list of features we look for in a top-notch multimedia monitor and then checked to see how each monitor matched up. Here's the scoop:

Resolution. All the monitors support resolutions of 640 x 480 pixels, 832 x 624 pixels, and 1,024 x 768 pixels. Also, the AppleVision 1710AV, IBM 17S/S, and Nokia 447W offer a maximum resolution of 1,280 x 1,024 pixels, which is handy when you need to view large chunks of data. (You need a third-party video card to drive the monitors at this resolution, however.)

Image Controls. All the monitors except for the Philips models offer digital on-screen controls that you manipulate via a set of four or more buttons on the front of the monitor. The Philips monitors take the minimalist approach, by offering analog brightness and contrast knobs in addition to several basic on-screen controls. Some users may prefer analog controls, because accessing them is quick and adjustments are intuitive, but digital on-screen controls offer more fine-tuning options and give you better visual feedback on your adjustments. Many digital controls additionally allow you to revert to the factory settings with a mouse click, making experimentation less risky for users unfamiliar with the more obscure manipulations.

All the monitors have brightness and contrast controls (digital or analog) as well as degaussing and pincushioning adjustments. Pincushioning can occur after you switch resolutions, making controls a necessity. Most monitors include an additional 10 to 15 on-screen digital controls that, for example, let you center an image vertically or horizontally or rotate it. Most also allow you to set the color temperature. You may not need all these fine-tuning features, but they can prove useful, especially as your monitor ages or if it is jostled in a move.

The AppleVision 1710AV's controls were our favorites. Easy-to-understand icons and arrows point you in the right direction as you adjust contrast and brightness, basic geometry, and color temperature. Although the IBM 17S/S, Nokia 447W, Panasonic PanaMedia 17, and ViewSonic 17GA also offer an impressive array of digital on-screen controls, none quite equal the sophistication and simplicity of the Apple monitor's.

Audio Controls. Once again, both Philips models scraped by with the basics, offering only analog volume controls. The IBM 17S/S, the Panasonic PanaMedia 17, and the ViewSonic 17GA earn kudos for separating the mute and volume adjustments from the main on-screen control menu, making them quickly accessible. But it was again the AppleVision 1710AV that earned the highest praises, for its on-screen bass and treble tuners (speaker controls not found on the other monitors). The Apple monitor also lets you set the volume level for your headphones separately from the speaker volume.

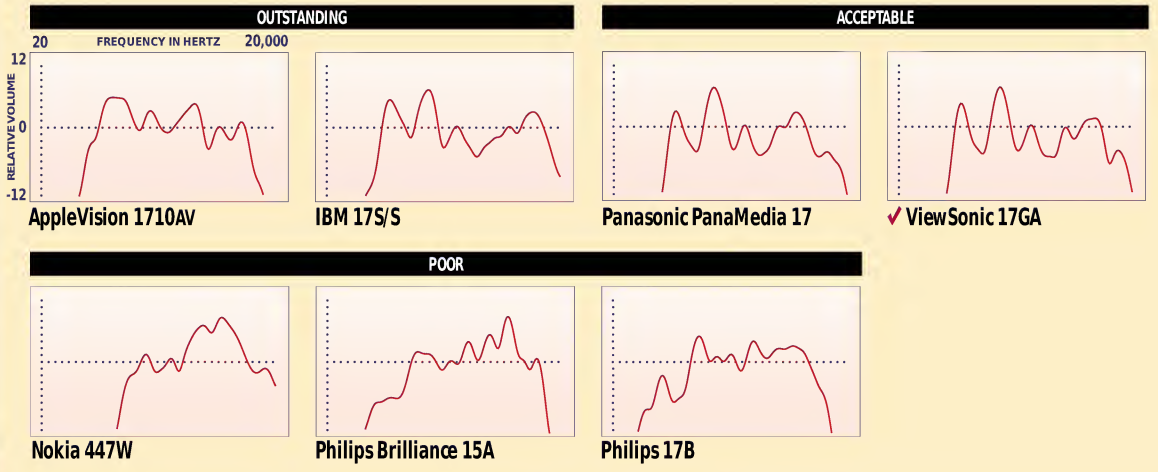
Adapters. Most of the monitors can be used with either a Mac or a PC, and most require an adapter to hook up to the Mac. All except for the IBM 17S/S, the Panasonic PanaMedia 17, and the ViewSonic 17GA come with the proper adapters. ViewSonic and Panasonic will include an adapter free of charge, but only if you request it. To hook up an IBM 17S/S to your Macintosh, you must purchase a multiple-

SOUNDING OFF / sound quality from best to worst

It's all in the expectations. True audiophiles may not like the sounds they hear blasting from even the best multimedia monitors. But for users who are content with sound quality that falls between that produced by the Mac's built-in speakers and a home stereo system, several of the multimedia monitors will do quite nicely.

We tested the seven units to find out how consistently they could reproduce sound over the varying frequencies that fall within the human hearing range (20 to 20,000 hertz). When we compared our subjective ratings with the objective results, we noticed a pattern. Subjectively, we preferred those speakers that did two things well — covered a high percentage of the human hearing range (how close the start of the line in a chart is to 20 hertz and how close its end is to 20,000 hertz) and produced consistent volume (how close the line is to the 0 level in a chart).

We've grouped the results subjectively. The volume of each speaker at 1,000 hertz, where human hearing is most sensitive, is given the value 0. The volume at all other frequencies is shown relative to that value.



✓ MacUser BEST BUY

resolution adapter such as the Liberty Adapter ($39.95 list), from Enhance Cable Technology (800-717-8757 or 408-232-0200).

Built-in Extras. As multimedia continues to evolve, the definition of multimedia monitors will expand to include more than just built-in speakers. The AppleVision 1710AV, IBM 17S/S, Nokia 447W, Panasonic PanaMedia 17, and ViewSonic 17GA come with built-in microphones that enable you to record sounds and that facilitate teleconferencing. The IBM 17S/S even includes a video-camera compartment on the top front that allows you to hook up a camera for videoconferencing.

Warranties and Guarantees. You may be tempted to toss warranties that come with less expensive appliances, but when you're shelling out $1,000 or more, you can't afford to be left in the lurch if the item breaks down. The IBM 17S/S, the Panasonic PanaMedia 17, and the Philips Brilliance 15A each come with an impressive, three-year warranty on parts and labor. The AppleVision 1710AV has the worst protection against product failure, with a meager, one-year parts-and-labor warranty.

As for money-back guarantees, only the IBM 17S/S has a 30-day money-back offer direct from the manufacturer. Nokia and ViewSonic leave the option of providing money-back guarantees up to dealers. You should check a store's policy before purchasing one of these vendor's monitors.

Manuals and Support. Detailed manuals and toll-free support lines are useful for making sense of the myriad of on-screen controls and for troubleshooting minor glitches. The AppleVision 1710AV's 158-page manual covers everything from installation to color calibration, using detailed illustrations and step-by-step instructions. An index quickly guides you to where you need to go.

The manual packaged with the Panasonic PanaMedia 17 also supplies comprehensive instructions and clearly displays the toll-free help number for anyone with questions. On the other hand, IBM does not list a help number anywhere in its manual. The guide's small type, sterile graphics, and stilted instructions make referring to the guide unpleasant and confusing.

Each company offers toll-free tech support, although operating hours vary. Panasonic deserves recognition for its high level of customer support — it's the only company to offer around-the-clock support, seven days a week. The other companies' support lines are open only between about 7 A.M. and 8 P.M. EST — and don't even think about getting help from any company besides Panasonic if your monitor breaks down on the weekends or major holidays.

THE PRICE IS RIGHT

Once you've stared at the screens, jacked up the speakers, and inspected the extras, you may still be confused about which monitor to buy. You may even still be wondering whether you wouldn't be better off buying a plain-old monitor and a pair of stand-alone speakers. Frankly, we still have qualms too.

After looking at all the variables, we've found that you get more for your money with an all-in-one audiovisual package. Yet competitive shoppers may be turned off by the current limited supply. At the time of our testing, the small crop of seven multimedia monitors was small potatoes compared to the abundance of soundless monitors that appear on the scene every month. And the audiophiles among us woefully noted that if you're willing to spend upwards of $150, you can get superb stand-alone speakers.

That said, we did find two multimedia monitors that we would be perfectly happy to have on our desks — the AppleVision 1710AV and the ViewSonic 17GA. The AppleVision 1710AV garnered high

EXECUTIVE SUMMARY / the best and worst features

What's hot and what's not — here's the place to find out where each of the monitors shines and where it doesn't. We've also included the key specifications for each monitor, statistics such as the maximum resolution and the length of the warranty. We didn't, however, list all the standard features the monitors have in common — things such as contrast and brightness controls, antiglare treatment, and Energy Star compliance.

	LIST PRICE	ESTIMATED STREET PRICE	VITAL STATISTICS	HITS	MISSES	WARRANTY	COMPANY INFORMATION
Apple AppleVision 1710AV 	NA	$1,159	17-inch Trinitron tube with a maximum resolution of 1,280 x 1,024 pixels at a 75-Hz refresh rate	Deep bass response and a bright, colorful screen. Variety of simple-to-use controls make using this monitor easy to master.	Fuzzy text and slightly blurry lines. Full-figured price tag hurts the wallet.	1 year parts and labor	Cupertino, CA 800-538-9696 408-996-1010
IBM 17S/S 	$1,400	$1,300	17-inch shadow-mask tube with a maximum resolution of 1,280 x 1,024 pixels at a 75-Hz refresh rate	Easy-to-use digital on-screen controls; superior sound reproduction; and a bright, crisp display.	Poor convergence and a downright hefty price.	3 years parts and labor	Research Triangle Park, NC 800-772-2227 914-765-1900 800-426-3395 (fax)
Nokia 447W 	$850 (direct)	NA	17-inch shadow-mask tube with a maximum resolution of 1,280 x 1,024 pixels at a 80-Hz refresh rate	Razor-sharp lines and on-screen controls available in six languages.	Sound quality reminiscent of poor AM-radio reception.	3 years parts and labor, 2 years on CRT	Sausalito, CA 800-296-6542 415-331-6622 415-331-6211 (fax)
Panasonic PanaMedia 17 	$999	$830	17-inch shadow-mask tube with a maximum resolution of 1,024 x 768 pixels at a 75-Hz refresh rate	Crisp text and sharp lines. Around-the-clock, toll-free support never leaves you in the lurch.	Dark display creates low contrast.	3 years parts and labor	Secaucus, NJ 800-742-8086 201-348-7000 201-392-4760 (fax)
Philips Brilliance 15A 	$599	$500	15-inch shadow-mask tube with a maximum resolution of 1,024 x 768 pixels at a 75-Hz refresh rate	Small screen equals small price.	Scratchy, muffled audio makes silence sound good.	3 years parts and labor	Knoxville, TN 800-822-1219 615-521-4316 615-521-3210 (fax)
Philips 17B 	$899	$800	17-inch shadow-mask tube with a maximum resolution of 1,024 x 768 pixels at a 75-Hz refresh rate	Best convergence creates pure colors.	So-so sound quality due to side-mounted speakers. Dark screen makes word processing tedious.	2 years parts and labor	Knoxville, TN 800-822-1219 615-521-4316 615-521-3210 (fax)
✓ **ViewSonic 17GA** 	$995	$850	17-inch shadow-mask tube with a maximum resolution of 1,152 x 870 pixels at a 75-Hz refresh rate	Offers the most-consistent audio and image quality. Warm, realistic screen colors.	Speakers provide only minimal bass response.	3 years parts, 1 year labor	Walnut, CA 800-888-8583 909-869-7976 909-869-7958 (fax)

✓ MacUser BEST BUY

honors, for its full range of sound; extensive controls; and bright, vivid images. But at an estimated street price of $1,159, it may be too expensive for some budgets.

The ViewSonic 17GA, however, receives our BEST BUY rating. This monitor performed solidly in all of our testing categories, and its screen images displayed warm, realistic color. And with an estimated street price of $850, it's definitely priced right. After all, these multimedia monitors are still best suited for users who don't want to pay the high price associated with high end.

Nikki Echler is a MacUser assistant editor. Associate lab director Nathan Garcia managed the testing for this report.

QUICK LABS

•The Coolest-Looking Monitor Ever •A Revamped Workgroup Printer •Compact Hard Drives

Not since the days when the Maytag repairman sat forlornly by the phone waiting for a service call has product support — or the lack thereof — created such concern. Despite improved product quality, more and more users want to be reassured that someone will be there to answer questions and replace parts when something goes awry. Vendors, however, aren't always clear about whom to call in your time of need or even what parts they'll replace under warranty.

Before you buy expensive hardware, pore over the warranty to find out exactly what it says. Many vendors offer varying combinations of coverage to reduce costs. For example, a three-year parts-and-labor warranty for a monitor may not include the picture tube, which is the most expensive item to replace.

To clear up some of this confusion, from now on, Quick Labs' warranty listing will represent the shortest length of time covered by any component of the warranty. Even though a company may cover parts and labor for three years, if the CRT on a monitor is covered only for one year, we will list the warranty as being for one year. By reducing the warranty to its lowest common denominator, we're trying to make you aware of exactly how much "free time" you have with your hardware.

Also new this month: Quick Labs goes online. Check out "MacUser/ZMac Utility of the Month" in this month's New on the Menu for more details.



ONE FLEXIBLE PRINTER

The QMS 1660E has been shipping since January 1995, but we decided to test it this month, for two reasons. One is pragmatic — vendors didn't ship any brand-new monochrome printers this month. The other is more practical: QMS just began shipping the 1660E in a new configuration, with 48 MB of RAM instead of the original 16 MB. The extra memory boosts the printer's price by about $2,000, to roughly $6,000, but unlike the lower-RAM configuration, which topped out at a resolution of 600 x 600 dpi, 48 MB provides enough imaging power for a workgroup to print handsome, full-bleed 11-x-17-inch documents at 1,200 x 1,200 dpi.

Text output from the 1660E was outstanding, as we'd expect from a 1,200-dpi laser printer; line art was also excellent. Photographic images, although acceptable for most general-purpose business documents, had some banding along the images' vertical axes — regardless of the images' page orientation.

The 1660E's output speed for our test documents, which were all standard letter-sized pages, was comparable to that of other workgroup workhorses we've tested in recent months. The 1660E is also flexible enough for most work settings — its RJ-45 connector plugs into any Ethernet network easily; it ships with drivers and software for Windows, OS/2, and UNIX as well as for the Mac OS; and it supports all standard network protocols.

The 1660E comes standard with a letter-sized paper tray that holds 250 sheets and a second 11-x-17-inch tray that can hold paper, transparencies, or envelopes. QMS sells extra trays that hold 250 sheets or 500 sheets, in both 11-x-17-inch and 8.5-x-11-inch sizes.

REVIEWER / JIM SHATZ-AKIN TESTING / JIM GALBRAITH

+ / OUTSTANDING ● / ACCEPTABLE − / POOR

	ESTIMATED STREET PRICE	RESOLUTION	WARRANTY	TEXT QUALITY	GRAPHICS QUALITY	PAPER HANDLING	SUPPORT	COMMENTS	PAGES PER MINUTE
★★★★ QMS 1660E	$5,999	1,200 dpi	1 year	+	●	●	●	Versatile workgroup printer that produces great text and line art.	FASTER 0 3 6



SIX SPACIOUS HARD DRIVES

Big drives, small drives: We tested a few of each this month. The compact FWB Hammer PE 520 and Hammer PE 1000FMF (pictured) are ideal for desks that are tight on space. Each drive has a Quantum Fireball mechanism, and each comes with FWB's Hard Disk ToolKit software, a combination that makes them fast performers for their respective capacity classes. Hard Disk ToolKit sports a rich set of features for users who want options for formatting, trouble-shooting, and tuning their drive.

The APS MS 1 GB sports a Micropolis mechanism housed in a compact case. The Cutting Edge Diplomat Q850 has a supersmall, easily toted case. Its power supply is external — handy if you need to replace it. Unfortunately, we found Cutting Edge's tech support unresponsive.

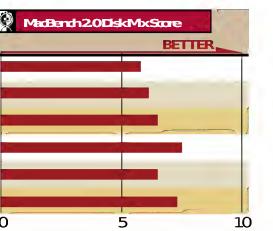
If you need a high-capacity drive, check out the Mirror 4.0 GB or the PLI Infinity 4.0 GB. Each has a more traditional, full-sized case, and each is speedy — in all, a competent duo.

We tested drive speed by using MacBench 2.0's Disk Mix test. The results are relative to that of a 250-MB Quantum IDE drive in a Quadra 630, which has a score of 1.0.

REVIEWER / ROMAN LOYOLA TESTING / KRISTINA DE NIKE

+ / OUTSTANDING ● / ACCEPTABLE − / POOR	ESTIMATED STREET PRICE	FORMATTED CAPACITY	PRICE PER MEGABYTE	WARRANTY	CASE	SOFTWARE/ MANUALS	SUPPORT	COMMENTS
APS MS 1 GB	$649	999.5 MB	$.65	5 years	+	●	+	Great case, great warranty. An all-around good bargain.
FWB Hammer PE 1000FMF	$642	1,039.8 MB	$.62	2 years	●	+	+	Compact case. Excellent software for tweaking settings.
FWB Hammer PE 520	$439	517.8 MB	$.85	2 years	●	+	+	We like it, but 500-MB drives are no longer value leaders.
Mirror 4.0 GB	$1,299	4,103.0 MB	$.32	5 years	●	●	●	Has a traditional, full-sized case. Fast, but a tad noisy.
Cutting Edge Diplomat Q850	$299	808.5 MB	$.37	2 years	●	●	−	Teeny, tiny case — cute even. But we're still waiting for tech support.
PLI Infinity 4.0 GB	$1,499	4,103.1 MB	$.37	2 years	●	−	●	Nothing remarkable, but it works just fine — and fast.

MacBench 2.0 Disk Mix Score (BETTER)



LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.



FIVE FINE MONITORS

A clean, sharp screen image and a wide array of controls make Portrait Display Labs' rotating monitor, the Pivot 1700 (pictured), more than just a marketing gimmick. By physically turning this sturdy monitor, you can view images in either portrait or landscape mode. After you flip the monitor, simply click your mouse, and the screen redraws, placing icons and open windows in their correct positions. The monitor can double as a conversation piece, thanks to its pattern of ventilation holes and its curves.

Substituting sensationalism for simplicity, the ViewSonic 17PS is a high-quality display system with easy-to-use controls. Digital front-panel buttons control an on-screen menu that lets you choose among 19 image adjustments. The LG Electronics Goldstar 2010 offers similar, but fewer, on-screen options through flimsy front-panel controls.

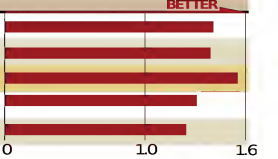
The PowerMax PM17TE+ and the ArtMedia TG1882 twins have the same box design and offer identical screen-geometry and image adjustments. To use the controls, however, you must be part contortionist — for example, to activate the default settings, you must fiddle with a combination of buttons while pushing in the reset button with a ballpoint pen. If you're willing to sacrifice user-friendly controls, you'll find that either model is a fine choice.

The image-quality scores reflect the results of our tests for image sharpness, focus, brightness, uniformity, pincushioning, color range, color accuracy, and vibrancy. Maintaining focus and sharpness is more difficult on larger monitors, so 20-inch monitors tend to score lower than smaller models. A score of 1.0 is considered acceptable.

REVIEWER / NIKKI ECHLER TESTING / MARTIN WONG

+ / OUTSTANDING ● / ACCEPTABLE − / POOR	ESTIMATED STREET PRICE	SCREEN SIZE	MAXIMUM RESOLUTION	WARRANTY	MANUALS	SUPPORT	CONTROLS	COMMENTS
Portrait Display Labs Pivot 1700	$995	17 in.	1,280 x 1,024 pixels	3 years	+	●	●	Space-age case holds ace performer.
ArtMedia TG1882	$999	17 in.	1,600 x 1,200 pixels	1 year	−	●	●	Straight-A screen quality but awkward controls.
PowerMax PM17TE+	$999	17 in.	1,600 x 1,280 pixels	3 years	−	+	●	Sharp, bright screen images make up for low-end controls.
ViewSonic 17PS	$995	17 in.	1,600 x 1,280 pixels	1 year	+	●	+	Large cast of on-screen controls and a decent display.
LG Electronics Goldstar 2010	$1,599	20 in.	1,600 x 1,280 pixels	2 years	●	●	●	Average attributes at a high price.

IMAGE-QUALITY SCORE (BETTER)



LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

GET INFO/ **APS Technologies** 816-483-1600 **ArtMedia** 408-980-8988 **Cutting Edge** 619-667-7888 **FWB** 415-833-4616 **LG Electronics** 201-816-2000 **Mirror Technologies** 612-830-1549 **PLI** 612-830-1549 **Portrait Display Labs** 510-227-2700 **PowerMax** 503-232-9903 **QMS** 334-633-4300 **ViewSonic** 909-869-7976

PAINT PROGRAMS /

Reach Out and Retouch Someone

Telepaint with Painter 4, animate with Dabbler 2.

MIMICKING A MASTER MOSAICIST and imitating a Disney animator are now possible with Fractal Design's Painter 4 and Dabbler 2. The latest version of Painter also adds the ability to collaborate with other artists over the Internet. Dabbler 2 gives novice artists new animated tutors and tools for creating QuickTime animations.

Painter 4. The natural-media paint program has long offered brushes that imitate pencils or oils, but now it creates mosaic tile work too. Instead of being a simple filter that breaks up an image into little boxes, Painter's new Mosaic brush lets you paint with colored squares, controlling the tile size and grout width as you go. For a more realistic look, the mosaic's shapes respond to adjacent tiles by automatically adjusting their position within the image.

Speaking of shapes, Fractal expands Painter's Bézier capabilities with tools for drawing basic shapes and editing Bézier lines. Painter even anti-aliases the shapes so they're easier on the eyes.



Telecommuting frees users from the office shackles, and now Fractal gives us "telepainting," which lets users collaborate on a piece of art, even over the Internet. This means that a Painter user on a Mac can host other artists using any version of Painter on any platform with AppleTalk, IPX, or TCP/IP network protocols. Think locally, paint globally. $499.

Dabbler 2. Novice artists not ready for telepainting or Mosaic brushes can learn more about animation by using Dabbler 2. This entry-level paint program gives you nearly two hours of new QuickTime-based tutorials on an included CD-ROM.

Dabbler's Tutors reveal the basics of drawing cartoon-style pictures and animations. Because a Tutor plays in a floating window next to the Dabbler canvas, you can stop it at any time to practice what you've learned. The animation Tutor includes rich material from former Disney animator Preston Blair.



Animation is integral to Dabbler's new "flipbook" feature. Like Painter 3, Dabbler 2 lets users paint frame-by-frame animations with controls for onion-skinning — drawing on successive transparent layers — and fast-forwarding and rewinding flipbooks. You can print the animations as a series of images to cut and staple into an actual flipbook. To help you get started, Dabbler 2 also includes more than 100 paper textures, hundreds of stencil shapes such as map outlines, and character fonts from Image Club. $69. Upgrade from 1.0, $29. 408-688-5300. / Sean J. Safreed

ELECTRONIC PUBLISHING /

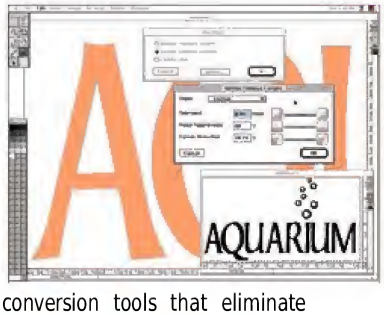
Adobe Acrobat Strikes Back

IT'S NOT A MAJOR UPGRADE, but users of PowerPC-based computers will find Adobe Acrobat 2.1 to be an incredible improvement on version 2.0, for one simple reason: The free Acrobat Reader and the $195 Acrobat Exchange are finally PowerPC-native. Also new to version 1.2 of Reader (available online from Adobe) is Acrobat WebLink, which extends Acrobat's hyperlinks to the Internet — click on an Internet link, and Acrobat will automatically launch a Web browser or FTP client to take you to the appropriate corner of the Net.

With version 2.1, Adobe is also finally offering a Mac version of Acrobat Catalog ($500; included with the $1,595 Acrobat for Workgroups), a utility that was previously available only for Windows and that is used for creating full-text-search indexes. And although users previously had to buy a copy of Acrobat Exchange in order to perform full-text searches, Adobe is now offering a tool kit for CD-ROM developers that will enable searching in Acrobat Reader. Upgrade from Exchange 2.1, $29; upgrade from Acrobat for Workgroups 2.1, $199. 800-833-6687 or 415-961-4400. / Jason Snell

ScanVec's Paper Tracing

A PLETHORA OF illustration packages doesn't stop artists from drawing on paper and then scanning sketches to get a digital duplicate. But converting the bitmapped image into PostScript line art doesn't always go smoothly. ScanVec's Tracer makes conversion more accurate, with unique editing tools.



Like other tracing packages such as Adobe Streamline, Tracer lets you specify whether to follow a bitmapped image's outline, trace its centerline, or use a combination of the two methods. Tracer converts only black-and-white PICT or TIFF images into EPS format for importing into illustration or page-layout applications. Other export formats are HP-GL and DXF.

Unique to Tracer are custom conversion tools that eliminate the tedious editing of Bézier control points. To create smooth curves, you can set two points and Tracer automatically fits a Bézier line between them, according to the bitmap. The corner tool squares off rounded joins, and any irregular blob can instantly become a perfect circle. $795. 508-694-9488. / SJS



Mitsubishi Dye-Subs Let It Bleed

IF YOU'RE GOING TO PAY for an expensive dye-sub printer, why not buy one that can print page spreads at full size with color bleeds? Mitsubishi's new DiamondScript I (a.k.a. the S6600-40U) allows you to print images of up to 11.92 x 17.17 inches at resolutions as high as 300 x 600 dpi.

Unlike Mitsubishi's previous tabloid-capable dye-sub, the DiamondScript I includes an Adobe PostScript Level 2 controller and supports Apple's ColorSync color-matching standard. Priced at $14,995, this new model ships with 24 MB of RAM, so you can start printing right out of the box. A 260-MB internal hard drive serves as a print spooler and stores frequently downloaded fonts. Parallel, serial, and LocalTalk connections are included, and EtherTalk is a $990 option.

It accepts four paper sizes — letter, legal, tabloid, and wide tabloid — and uses monochrome, three-color, or four-color ribbons. 800-843-2515 or 714-220-2500. / Pamela Pfiffner

Plug-ins Meld Illustrator, Photoshop

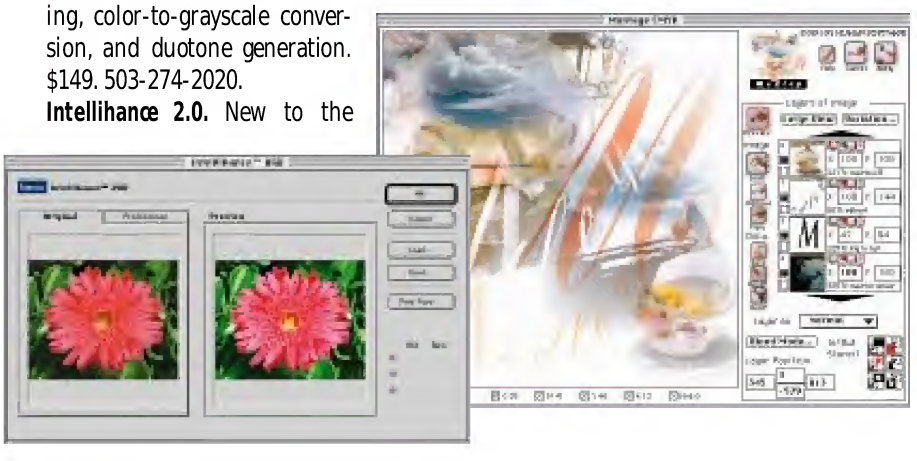
CROSSING THE BOUNDARIES between bitmapped and vector graphics, Extensis' DrawTools and Human Software's Medley bring creative tools found in image-editing packages to Adobe Illustrator and Macromedia FreeHand. Or if trying to correct the colors in a bitmapped image has you stumped, try Intellihance 2.0, also from Extensis.

DrawTools. Formerly from Scarlett Graphixx, this set of integrated plug-ins sports a new interface and includes modules that can reshape, color-correct, and precisely move objects in Adobe Illustrator or Macromedia FreeHand. The Shape module can wrap vector artwork around a variety of user-definable 3-D shapes à la Adobe Dimensions. In FreeHand, the shape tools work interactively, so you can position 3-D shapes within the work space rather than using a clumsy modal dialog box.

The DrawTools Color module provides vector artists with a number of the color-correction options available in Adobe Photoshop, including gamma-curve editing, color-to-grayscale conversion, and duotone generation. $149. 503-274-2020.

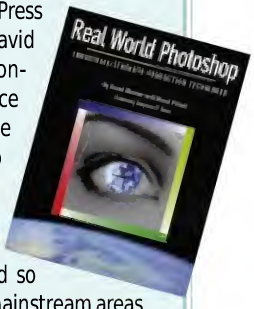
Intellihance 2.0. New to the Extensis lineup is Intellihance 2.0, formerly from DPA Software. The original filter distilled the arcane control dialog boxes in Photoshop into simple menu choices. Version 2.0 of this Photoshop plug-in offers a revamped interface; before-and-after image previews; and easier-to-use slider controls for tweaking the tone, saturation, and sharpness of images. $149.

Medley. Human Software takes the powerful masking and layering functions available in its AutoMask Photoshop plug-in and puts them into Medley, a plug-in that works with Illustrator and FreeHand. Like AutoMask, Medley can quickly composite up to 64 RGB or CMYK images, using a variety of blending modes. Medley also has interactive masking brushes for creating soft feathered areas and simple drop shadows. The plug-in requires just 8 MB of RAM, and its images can be more than 100 MB in size, thanks to the proxy-based preview. The final result is an EPS file placed in Illustrator or FreeHand. $199. After January 1, $295. 408-399-0057. / SJS



Photoshop by the Book

SOME SAY you can never be too rich or too thin or have too many books on Adobe Photoshop. And judging by the Photoshop tomes flooding our office, we'd tend to disagree. Separating the wheat from the chaff can be tricky. Here are a few titles on which we've come to rely. ✲ If you spend lots of time in Photoshop color-correcting images and preparing them for print, then you want **Real World Photoshop 3: Industrial-Strength Production Techniques.** Just published by Peachpit Press and written by David Blatner and MacUser contributing editor Bruce Fraser, this exhaustive look at how Photoshop really works fearlessly delves into gamma, white point, black point, tonal curves, and so on. It also covers such mainstream areas as how to get great scans with Photoshop and your desktop scanner. $35. 800-283-9444 or 510-548-4393. ✲ Photoshop is famous for its fancy filters and special effects. For those who want to see Photoshop artists in action, there's **The Photoshop 3 Wow! Book,** newly revised by Linnea Dayton and Jack Davis (Peachpit Press). Richly illustrated with step-by-step techniques, it will inspire and amaze you — who knew there were such, um, diverse talents out there? $40. And if you want to try your hand at special-effects wizardry, take a look at **Photoshop Filter Finesse,** which lets you follow along with accomplished digital artist Bill Niffenegger as he plays with scores of interesting techniques. Random House. $45. 800-733-3000 or 212-751-2600. ✲ Two bookshelf mainstays are **Photoshop 3 for Macintosh: Visual Quickstart Guide,** by Elaine Weinmann and Peter Lourekas (Peachpit again), a kind of Cliff's Notes for Photoshop ($20) and **Advanced Adobe Photoshop: Classroom in a Book,** the official training book from Adobe Systems, with a CD-ROM of sample images. A beginner's edition is also available. $50. Distributed by Macmillan. 800-428-5331 or 317-581-3535. ✲ We've only skimmed **Photoshop Artistry: A Master Class for Photographers and Artists,** by Barry Haynes and Wendy Crumpler (Sybex), but this book of hands-on exercises looks promising. $50. 800-227-2346 or 510-523-8233. And the list goes on . . . . / PP



GIFT GUIDE / BY PAMELA PFIFFNER

Favorite Things

Brown-paper packages tied up with string may satisfy some people, but what delights desktop publishers and graphic artists? Here's our guide to DTP holiday giving.

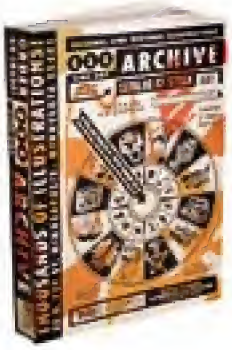
HOHOHOHUM. The holiday season is here, filling us with the anxiety of finding The Perfect Gift. Never fear: We've put together a shopping list to please the graphic artists and desktop publishers on your holiday gift list.

Start your shopping with a trip to the mall — the font mall, that is. Open up the beautifully designed **Precision Type Font Reference Guide** ($40), and pick a handful of fonts from mainstream stores such as Adobe Systems, Monotype Typography, and ITC or from designer boutiques such as The Font Bureau, T-26, Carter & Cone. Better yet, Precision Type offers font gift certificates ranging in value from $25 to $250, so your DTP pals can choose their own. 800-248-3668 or 516-543-3636. Another source of innovative type is **FontShop International,** which specializes in cutting-edge design with a European flair. Its sleek catalog, FontBook ($39), is a gift in itself. 800-897-3872 or 312-360-1990. The new **AgfaType Creative Alliance** offers exclusive fonts (not sold in stores!) designed by a who's who of contemporary type designers. Call for its free AgfaType Catalog. 800-424-8963 or 508-658-5600.

If selecting fonts for a finicky friend is too daunting, slip the **Bitstream MasterWorks** font collection under the tree. This CD-ROM contains 200 of Bitstream's best-selling fonts in PostScript as well as TrueType format. $399. 800-522-3668 or 617-497-6222. For fun display type, there's **Image Club Graphics' LetterPress Special Edition** CD-ROM of 160 PostScript fonts, including 20 picture fonts. $449. 800-661-9410 or 403-262-8008.

Compact discs are a holiday classic, but instead of getting the new Oasis CD, opt for a CD-ROM of photographic images or clip art that has a bit more snap and crackle than utilitarian images of busy executives or brilliant sunsets. For example, we like the playful black-and-white Retro Americana ($299) collection of stock photos, from **PhotoDisc.** For unique objects that can be plopped into any image, try PhotoDisc's Retro Relics ($149), Architectural Elements ($149), or any volume from PhotoDisc's eight-disc CMCD object library of visual symbols. $159 each. 800-528-3472 or 206-441-9355. The **Classic Photographic Image Objects** library — photos of movie props from Hollywood — is a riot, especially the new Classic Nostalgic Memorabilia collection. $70. 800-370-2746 or 818-564-8106.

A pioneer of the retro revival, **CSA Design** sells a whopping two-pound hardcover catalog ($50) of its distinctive line-art images. Each of the 7,777 images is copyrighted, so you have to pay a fee to use them, but it's a great source of inspiration. Better yet, order the CSA Archive CD-ROM of 100 copyright-free images ($95). Even better still, dress your desk with neato retro accessories — such as face-changing magnets ($20), canned 3-D "clip art," cheeky wristwatches ($69), Slacks cologne that lets you "smell like your Dad" ($35), and even actual coffee tables ($185) bearing CSA's '50s style line art — from the CSA Archive Collection. 612-339-1263.



For the gift that keeps on giving, sign your friends up for a subscription to **Art Parts,** an eclectic collection of EPS line art with the look of hand-drawn sketches. Each subscription ($40 per month) comes with the official Art Parts beanie and with Regular Joe the Font. Two "CD-RONs" are also available for $400 each. 714-771-6754. For the complete Art Parts experience, throw in the delightfully illustrated **A Day with Biff,** a book created entirely of Art Parts and designed by Ron and Joe, the noggins behind Art Parts. The book comes with a sampler disc. $25. Peachpit Press, 510-548-4393.

Ah, yes, books. Like Tinker Toys or Erector Sets, how-to books make great gifts — we highly recommend **How Desktop Publishing Works** ($25), by yours truly. ZD Press, 800-688-0448 or 510-601-2000. But the image-conscious may prefer trendy design









books such as **A Blip in the Continuum,** DTP maven Robin Williams' book on grunge typography, from Peachpit Press. A disc with 22 cutting-edge fonts is included. $23. Another possibility is **Emigre (The Book): Graphic Design into the Digital Realm.** For more than ten years, Zuzanna Licko, Rudy VanderLans, and the rest of the gang at Emigre have pushed the envelope in terms of Mac-generated graphic design, with their eponymous quarterly magazine, which incorporates Licko's original fonts (for sale from Emigre) and provocative essays on graphic design. This deluxe, signed, slipcased retrospective of their work comes with a music CD. $50. 800-944-9021 or 916-451-4344.

The Hard Stuff

Remember the thrill of receiving a Polaroid Swinger or, for you younger types, your first Sony WatchMan? This year's equivalent is the **Casio QV-10 LCD Digital Camera.** We've raved about this sexy little toy before (see "Photo Opportunities," November '95, page 82); it's just the thing for the guy or gal who has to have the latest cool gadget. $999. 800-962-2746 or 201-361-5400.

Most people think that a color printer is out of reach, but now there are options available for most budgets. For less than $400, you can give the print publisher in your life a personal photo studio, with the **Fargo FotoFun!** dye-sublimation printer. This little number produces photo-realistic prints the size of 4-x-6-inch snapshots from the local Fotomat. An optional $30 kit enables you to make four photo mugs — perfect for next year's gift giving. 800-327-4622 or 612-941-9470.

For printing layouts, flyers, invitations, and so on, you'll want to give a more versatile printer. The $400 **Apple Color StyleWriter 2400** (800-538-9696 or 408-996-1010) and the $500 **Hewlett-Packard DeskWriter 660C** (800-752-0900) offer high-quality inkjet printing at rock-bottom prices. Throw in **GDT Softworks' StyleScript 2.0,** software that transforms the 2400 into a PostScript printer, for just $149. 604-291-9121.

Wrapping up a pen as a gift sounds like something Great-Uncle Ernie might do, but not when it's a **Wacom Erasing UltraPen** for the Wacom ArtPad II and ArtZ II graphic tablets. Sold separately for $90 or bundled with a tablet (prices start at $175), the pen acts as if it had a real eraser when used with software that supports it. 206-750-8882. If you're new to the world of pressure-sensitive pens and natural-media software, **Fractal Design Dabbler** ($69) is a great product to start with. Dabbler provides many of the natural-media brushes and paper textures of its big brother, Painter, including support for the Erasing UltraPen, but Dabbler's interface is easier to use. For a truly great deal, you can buy the Dabbler/ArtPad II bundle, which includes software, tablet, and erasing pen for just $190. 800-297-2665 or 408-688-5300.

The desktop publishers on your list already have QuarkXPress; Macromedia FreeHand; and Adobe PageMaker, Photoshop, and Illustrator — if they don't, remedy that, pronto — but the holidays are an opportunity to give them software they wouldn't ordinarily buy themselves. **KPT Bryce,** from HSC Software, is a fascinating program that allows you to render incredibly beautiful photo-realistic landscapes for use in page-layout and multimedia projects. $199. 805-566-6200. You can round out the package with Susan Kitchens' **The KPT Bryce Book,** from Addison-Wesley. $40. 617-944-3700. And for devotees of the cult of Photoshop guru Kai Krause, there is always Nick Clarke's **Kai's Power Tools: The Illustrated Guide** ($40), also from Addison-Wesley.



Two fail-safe gifts: a higher-capacity hard drive and a handful of RAM. OK, so they're the digital equivalent of getting underwear and socks from Aunt Edna, but every desktop publisher needs them. Gigabyte hard drives cost less than $500 — check out our monthly Quick Labs feature for our picks of the latest models. However, even an extra 365 MB of storage (about $200 mail-order) will be greatly appreciated. To top it off, toss a fistful of SIMMs (or DIMMs, for the new PCI-based Power Macs) into the toe of a Christmas stocking, and watch any Photoshop user grin.

Bits and Pieces

Pamper them with paper — laser stock that makes even bad news look good. **IdeaArt** features only recycled papers with soy-ink imprints. The company's sampler pack includes a selection of paper, envelopes, labels, postcards, and so on for $20. You can order a catalog by calling 800-433-2278 or 615-889-4989.

When price is no object, seek out the Arts and Crafts-style furniture from **Green Design Furniture.** Made of North American cherry wood, a computer desk with a keyboard tray ($2,140), a printer stand ($695), and a bookcase ($1,190) assemble in minutes, without requiring tools. "Sets up faster than your computer," according to the company. 800-853-4234 or 207-775-4234.

Computers don't replace everything in the publishing process. Put together a grab bag of publishing essentials, all available at local art stores: a loupe for examining images close-up, a pica ruler, and a proportion wheel. Toss in new **Pantone** swatch books. $32 to $195 each. 201-935-5500.

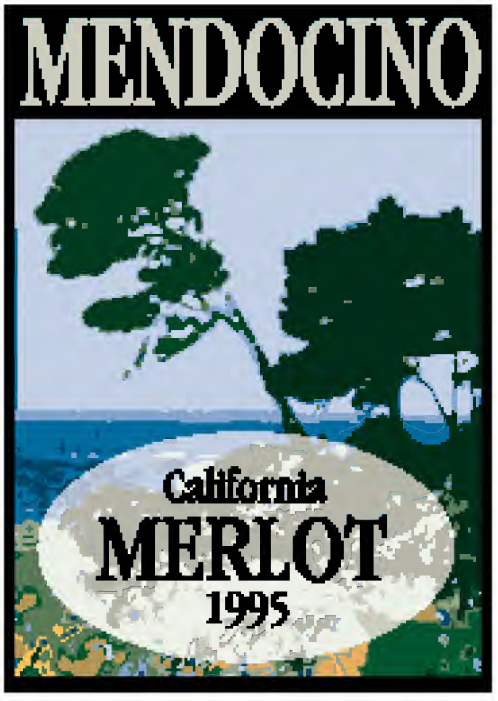
Finally, give your high-tech friends some historical perspective. The renowned **McKenzie & Harris** type foundry sells real metal type in a variety of designs — such as Centaur, Futura, Stymie, and Century — and in sizes ranging from 6-point to 72-point. Prices are $15 per pound. The minimum order is $25. 415-777-0716.

Executive Editor Pamela Pfiffner can do without The Sound of Music, but she does like whiskers on kittens.

GRAPHICS HOW-TO / BY JANET ASHFORD

Screening Back

Making transparent overlays is easy in Illustrator and FreeHand; just copy and desaturate.



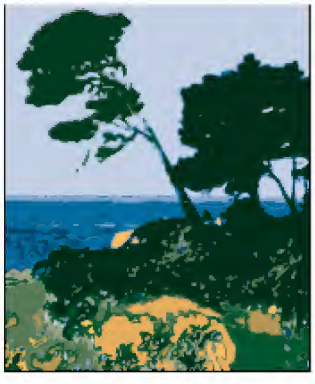
CREATING CONTRAST between graphic elements sets items apart and increases the impact of your message, and this is especially important for type. Outlining text with a contrasting color or placing black text over a lightened area (called a screened background) increases readability.

Screening a background is easy to do in Adobe Photoshop, but now you can achieve the same effect by using the Desaturate command in PostScript illustration programs such as Adobe Illustrator 5.5 and Macromedia FreeHand 5.0. Using Illustrator 5.5, I employed this technique to create a panel that sets off the type for a wine label.

Janet Ashford is the coauthor, with Linnea Dayton, of Adobe Illustrator: A Visual Guide for the Mac (Graphic-sha/Addison-Wesley, 1995).



1. Preparing the image. The background image is an original photograph of the Mendocino, California, coast (**a**). I scanned the image into Photoshop; converted it to grayscale (Mode: Grayscale); and posterized it (Image: Map: Posterize), with a Levels setting of 4, so that it contained only four gray tones (**b**).



2. Converting to PostScript. Opening the file in Adobe Streamline, I autotraced the scan by using the Outline mode (File: Convert) and saved the resulting file in Illustrator EPS format. In Illustrator, I filled each region with a custom color by selecting all the gray regions (Filter: Select: Same Fill Color) and changing the color in the Paint Styles palette. Streamline can convert color bitmapped images into color EPS files by selecting the most prevalent colors in the image, but I preferred to create a custom color palette.



3. Making the screen. To create the screened background, I first copied the art (Edit: Copy) and pasted it in front of the original (Edit: Paste In Front) so that the two were exactly aligned. I then moved the copy to a new layer (Layers Palette: New Layer). With the objects still selected, I applied the Desaturate filter (Filter: Colors: Desaturate) several times to lighten the image. To create the panel, I positioned an oval over the lightened copy and masked the copy into the oval shape (Objects: Masks: Make). The oval shape falls over the original art, lightening the area and providing plenty of contrast.



4. Applying the type. After using the Desaturate filter, I adjusted the white shapes in the oval area (Filter: Select: Same Fill Color) by adding a pale-green fill (10% cyan and yellow) to the shapes. I then added black type over the panel and a black border with pale-green type at the top (see the finished piece).

EXPERT TIPS / BY BOB SCHAFFEL AND CHUCK WEGER



All We Want for Business . . .

is our two font geeks. What we want for the holidays can't be wrapped up with a bow. Here's our wish list.

IN THIS SEASON OF GIVING, we want to propose a few things (in no particular order) that might better the desktop-publishing industry and thereby make our holidays — and our jobs — merry and bright.

A font-management system that works. After ten years of desktop publishing, we're still struggling with issues of displaying and printing documents properly. Adobe Type Manager takes care of simulating type on-screen when fonts required by the document are missing (as long as they're not symbol or pi fonts). But when printing, we don't want fonts that approximate the real thing — we want the actual real thing. We would like a utility (or system software) that's not only capable of interrogating the document for font requirements but also smart enough to find and install the missing fonts automatically.

Simple systems. Although we think there are numerous useful extensions, we want a system that doesn't require a lot of third-party stuff to achieve basic functionality. Come to think of it, maybe that's what everyone at Apple is calling Copland.

Better testing. Here's a revolutionary idea! How about more interoperability testing by vendors before they drop their products into the marketplace? It's really difficult for publishers to make any money when they're engaged in a never ending industrywide beta-test program.

Database management. As more and more data is converted from traditional materials into digital form and as original digital work mushrooms, we need databases that fit our work flow. The trouble is that most people think of a database as a warehouse for files. That seems a bit shortsighted to us. We need to rethink how data is broken down before it is "checked in" to the database. Instead of organizing databases around primitive field types, why not use databases to store decision sequences that drive the work flow? The result would be more production flexibility and greater data longevity, allowing for real "repurposing" of content.



Anything other than HTML. Because we are now repurposing our data for electronic content delivery, we'd like to see an authoring language for the Internet that doesn't look like warmed-over typewriting. In its current version, HTML has about as much pizzazz as dot-matrix printing. Of course there are some very clever HTML programmers creating exciting visual art with the tools, but most are content to produce information in HTML's usual boring format. The recent Adobe/Netscape announcements about supporting online use of Adobe Acrobat may change this dramatically. Stay tuned.

Reasonable RAM prices. Anyone want to start a philanthropic fund to rebuild the apocryphal Japanese manufacturing plant whose destruction by fire is being blamed for skyrocketing RAM prices? The cost of most chips — except RAM — is falling. While we're at it, how about designing computers that don't have different pin configurations in each model release. In some cases, we invest more in SIMMs and DIMMs than we do in computers. It'd be nice to get long-term use out of them.

Cheap ISDN. Because robust telecommunications is becoming a must for professional publishing, it would be a nice present if the phone companies would offer ISDN for the same price as a regular phone line. In New York City, ISDN is an operational and economic reality. In many other places around the country, though, it's not only unaffordable — it's also unattainable.

On-time delivery. Someone needs to give Apple a manufacturing schedule that allows it to actually deliver new computers when they are announced. Building up our expectations about wonderful new machines and then making us wait 30 to 60 days until the product gets into the pipeline seems Scrooge-like.

Affordable digital cameras. How about someone taking the risk to produce a quality digital camera the rest of us can afford? We always hear that the price is high because the market for digital cameras is small. Which came first — the chicken or the egg?

Whatever you have on your shopping list, we hope that you have a healthy and happy holiday season. May the god of installations smile on your technological innovation.

Bob Schaffel is emerging-technologies consultant for R. R. Donnelley & Sons. Chuck Weger is a consultant and publisher of the Photoshop Monitor newsletter.

HIGH-SPEED LANS /

Whitetree Branches from Ethernet to ATM25



THE BETTER-KNOWN ATM (Asynchronous Transfer Mode) standard, ATM155, remains a backbone technology limited by high cost and marketplace uncertainty, but another ATM standard — ATM25 — is showing promise for workgroup networking. Embraced by Apple when it joined the ATM Forum, the 25-megabit-per-second ATM25 standard is now supported in a workgroup-oriented hub from Whitetree (415-855-0855) that switches among ATM25 and 10BASE-T network media.

The WS3000 ($7,795) has 12 ports, each of which can function as an ATM25 or a 10BASE-T Ethernet port, depending on the NIC (network-interface card) installed in the connected end-station — that is, the computer or network device at the other end of the wire. The hub detects and accommodates the appropriate media type for each port automatically and independently of the other ports.

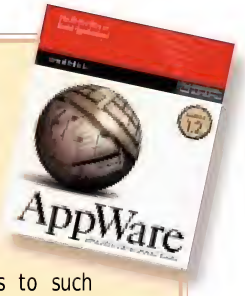
Two network-option slots provide connectivity to other networks and switches. With Whitetree's ATM155 Network Option Module ($1,395), the WS3000 can connect workgroups to ATM backbones. The company's Stacking Bus Module ($1,195) lets you connect a WS3000 to other WS3000s (up to 12 can be stacked), for network expansion. The latter module will ship by year's end.

Whitetree's support of these two networking standards in one product is unique. Organizations currently using Ethernet but interested in moving to ATM25 or an ATM155 backbone can use the Whitetree hub to split the difference while allowing both network types to coexist.

For those who plan to move up to a high-speed LAN, ATM25 can provide an attractive way to accommodate high-bandwidth applications. Because ATM25 operates in full-duplex mode (data can travel two ways simultaneously), it's faster than would appear from its rated speed — possibly even faster in practice than the 100-megabit-per-second Fast Ethernet, which operates in half-duplex mode. ATM25 can also use Category 3 wiring (the dominant wiring standard until a year or two ago), whereas Fast Ethernet requires newer, Category 5 wiring. However, the high prices of ATM cards and hubs compared to those of Fast Ethernet ones will continue to inhibit ATM's growth in the marketplace. / Shelly Brisbin

CROSS-PLATFORM APPLICATIONS /

AppWare Cozies Up to Visual Basic, OpenDoc



THE DREAM OF EASILY CONSTRUCTING cross-platform applications is coming closer to fruition, as Novell (800-453-1267 or 801-429-5588) readies new versions of its AppWare development system — and as Novell and third parties issue new modules for AppWare.

AppWare lets developers choose from libraries of modules in order to build custom applications for Windows and the Mac OS. The modules — called AppWare Loadable Modules, or ALMs — can perform single functions or complex tasks, such as providing connectivity to an Oracle database or to WordPerfect for Macintosh. Users need not have traditional programming skills, according to Novell, so the system is well suited to VARs, MIS people, and consultants charged with developing custom applications.

One of the most important AppWare advances recently is the ALM for Visual Basic Controls (VBXes), which was included with the August release of AppWare 1.2. The free VBX ALM makes AppWare and Microsoft's Visual Basic programming language interoperable, so developers can use VBXes within AppWare without rewriting any code. Once a VBX has been dropped into the AppWare environment, it can be employed in new applications, just like the visual components in any other AppWare library.

Other recently released AppWare tool sets provide new imaging and Newton connectivity capabilities. Alta Impower Tools for Imaging ($7,500) is a set of ALMs from Alta Technology (800-214-9100 or 801-562-1010) that developers can use to integrate scanning and image-viewing capabilities into their software. Revelar Connection Utility ($49.95), from Revelar (800-669-5191 or 801-485-3291), is able to give AppWare-developed Newton applications instant access to such functions as Newton Names, Notes, To Do items, and Dates.

Novell's current plans for AppWare include developing new AppWare-based applications as well as new versions of AppWare. The applications will bring directory access and some NetWare-management functions to the Mac. A PowerPC-native release of AppWare, scheduled for late 1995, will include full support for building and using OpenDoc parts; a Windows 95 version will also be released late this year. In addition, Novell has announced that AppWare VBX Release 2.0 will be available early next year. / Mitzi Waltz

TELECOMMUNICATIONS /

Dayna Spin-off Brings Cellular to PBs

A NEW PRODUCT AND A SALE of subsidiaries are the latest aftershocks following the restructuring of Dayna Communications. The company's wide-area-wireless subsidiary, newly dubbed AirGo (reachable through Dayna, at 800-531-0600 or 801-269-7200), has announced its first product, the AirGo PhoneCard System. Dayna has also sold its remote-access business.

The AirGo PhoneCard is a Type III PC Card that contains both a modem (14.4 kbps, V.32bis) and a cellular phone. Users can make voice, fax, or data calls with the integrated card, which is compatible with PowerBooks and PC laptops. Connectors on the PhoneCard support the use of a handset, a DAA (data-access arrangement, for connecting the modem to an RJ-11 phone jack), or an external antenna (for wider reach than the integrated antenna can provide).

The AirGo PhoneCard System also includes a telephone handset of AirGo's design and AirGo PhoneBook software. The software stores contact information and can dial either the fax modem or the cellular phone.

Final pricing for the PhoneCard System was not available at press time. AirGo estimated the cost of the full package (including the PC Card, the handset, and software) at under $1,000, and the cost of a package containing the PhoneCard, software, and a Jabra Earphone Connector (for supporting voice calls) at under $800.

AirGo is partially funded by Dayna and uses technology developed there before the company reorganized earlier this year. In addition to splitting off the wireless subsidiary that became AirGo, the reorganization created another subsidiary that manufactured and marketed DaynaLINK remote-access servers. Dayna recently sold the remote-access subsidiary to Ascend Communications (510-769-6001), known for its WAN connectivity products. / SB



PHOTOGRAPHY / LON CLARK

HIGH-SPEED DIAL-UP /

3Com Delivers ISDN Modems

TELECOMMUTERS, NET SURFERS, and small offices are the intended customers for the Impact ISDN modems, from 3Com (800-638-3266 or 408-764-5000). The external, all-in-one devices include a BRI (basic-rate interface) and an NT-1 (network terminator), the two hardware components necessary for making an ISDN connection.

Both Impact modems — the 3Com Impact with Multilink PPP ($649) and the 3Com Impact with V.32bis ($749) — support Multilink PPP (MPPP), an ISDN protocol expected to be adopted as an industry standard in 1996. With MPPP, it's possible to bind the two 64-kbps ISDN channels together, for a total theoretical throughput of 128-kbps on a single call. Without MPPP, each channel functions separately, allowing two simultaneous, but slower, connections. The higher-priced Impact model also contains a built-in 14.4-kbps modem, for analog data calls.

In addition, both Impact products include an integrated analog voice port, which lets users connect telephone handsets or fax machines to an ISDN line. Users can make phone calls or send faxes on one channel while using the other to connect to the office or the Internet via ISDN.

3Com renamed and upgraded the Impact products after acquiring them from Access-Works Communications, which sold them under the QuickAccess brand name. Having added MPPP support with the upgrade, 3Com says it plans to expand the product line.

Current owners of Impact modems can purchase a Multilink PPP upgrade for $129 through the end of the year. / MW



NET BYTES

Shall We Dance?

NO LONGER A WALLFLOWER, the Mac is expanding **Wall Data's** RUMBA line, with the release of **Mac RUMBA.** The Mac RUMBA graphical terminal-emulation packages are based on Apple's SNA•ps products; Wall Data acquired SNA•ps last year. Mac RUMBA for AS/400 and Mac RUMBA for Mainframe are each priced at $345 per user. 800-487-8622 or 408-369-6900. ☆ A new version of MachTen, from **Tenon** (800-662-2410 or 805-963-6983; info@tenon.com), enhances the only UNIX operating system available for the Power Mac. **Power MachTen 4.0** ($695) features a redesigned architecture, including such UNIX niceties as dynamically linked shared libraries and memory-mapped file access. ☆ The developer of MacWeb has turned its attention to Internet security. **TradeWave** (512-433-5300; info@tradewave.com), formerly EINet, will soon ship **TradeSecret** (price not set at press time), a system that secures commercial transactions over the Internet by creating virtual private networks between parties. Businesses can grant sets of access privileges to customers. TradeWave also plans to release a new version of **MacWeb,** which will include support for tables, mail-to URLs, and other features now available exclusively in Netscape Navigator. MacWeb will continue to be free. ☆ **GenesisRegistration** ($795), a new offering from **WebGenesis** (607-255-5565; http://www.webgenesis.com), brings access privileges and passwords to Web sites. The Common Gateway Interface (CGI) works with StarNine's WebStar, a Mac Web server. The GenesisRegistration product allows site managers to register users and give them access to specific areas and services on the site. WebGenesis is also shipping **GenesisSurveys** ($495), a Web statistics package, and **GenesisJive** ($895), which allows Web-based conferencing.



☆ Version 2.5 of **ISDN Manager** ($2,795; upgrade, $149), from **4-Sight** (515-221-3000), adds a design-collaboration tool called QuickProof. Users of ISDN Manager can share a screen and "mark up" graphics or page layouts over a live ISDN connection. The originator of the images can make requested changes and update the image in real time. / SB

NET TOOLS / BY SHELLY BRISBIN

6 Net-Backup Secrets

If your neck's on the line when important data gets lost in a disk crash, don't take any chances — use these tips to make your network backup system a true safety net.

BUYING A TAPE DRIVE and network backup software is a big step beyond just handing your users a stack of floppies. But you also need to set up a smart backup system. Here are six tips for making sure your backup system won't fail you if — or rather, when — disaster strikes.

1. Ensure sufficient storage. Make sure your storage media are sufficient to back up all the Macs on your network. Start by adding up the capacities of all the hard drives used in your office, including those attached to servers and PowerBooks. Then estimate the amount of space needed by redundant data (applications and other files that are the same on all of your Macs), and subtract this amount from the sum of the hard-drive capacities. If your backup hardware or software supports data compression, reduce the total by 30 to 50 percent, depending on the compressibility of the files you're backing up (text files, for instance, can shrink by as much as two-thirds). The result is the minimum storage capacity you'll need — more is better.

2. Choose a good backup server. You don't need to dedicate a Mac solely to backup tasks. Many system administrators connect backup devices to their own Macs for convenience; others connect them to a Mac that's already being used as a file server. The latter option can provide faster backup (see figure 1) — plus added security, if the server is in a locked closet. However, be sure not to use a mail or calendar server as your backup server; programs such as QuickMail and Meeting Maker continuously update information across the network and can conflict with the backup process. Whichever setup you choose, make sure your backup server is a fast Mac (especially when you're using software-based data compression) with plenty of RAM.

3. Stick to a schedule. Back up all of your Macs every day — preferably at night, when the network is unused. The first backup always takes the longest, so schedule it over a weekend. Thereafter, set your backup software to perform incremental backups, which include only the files that have changed since the last time.

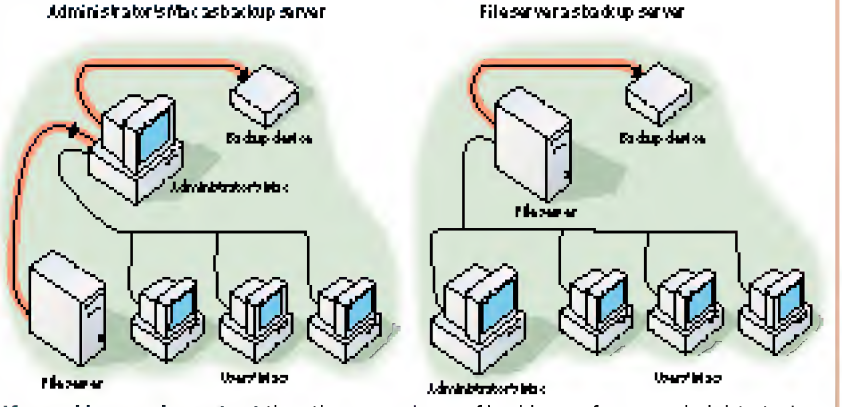
4. Make multiple backups. Use two or more sets of backup media. Rotate them so that each set is used on alternate days and the set not being used is off-site, in case of a fire or other disaster.

5. Don't forget PowerBook users. Schedule a regular PowerBook backup time when users are in the office or in their hotel rooms, and ask them to connect then for backup. Duo users are more often on the network, but they're usually using the computer when they're connected; try scheduling Duo backups for lunchtime. If your network has many PowerBook users, consider using Dantz Development's Retrospect 3.0 as your backup software. It can search the network for recently connected PowerBooks and back them up at a time each user can specify.

6. Make an "Up and Running" tape. Finally, make a plan for restoring data when users' systems crash. Create a tape that includes your company's standard applications, system software, and network-access programs. If a user's system goes down, restore the "Up and Running" system to an external hard drive or a spare Mac. That way the user can keep working while you deal with the crashed system and restore the data you so prudently backed up.

figure 1

The Best Backup Server / file server versus administrator's Mac



If speed is more important than the convenience of backing up from an administrator's Mac, think about using an existing file server as the backup server. With that approach, data on the file server doesn't need to travel across the network to be backed up; instead, it zips across the SCSI bus to the connected backup device.

MAC TO PC / BY JOHN RIZZO



Apple Serves Up NetWare

By porting NetWare to its PowerPC servers, Apple hopes to finally gain credibility in the world of corporate IS.

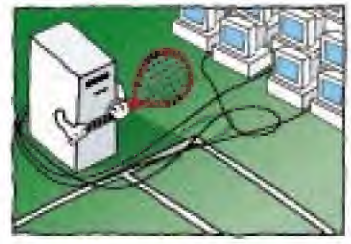
NEIL YOUNG HAS IT. Pearl Jam has it. Michael Jackson used to have it. Madonna never did have it. I'm talking about what the music industry is calling credibility, or more simply, cred. In the lingo, cred is a reputation for producing quality work without excessive ego. Among corporate information-services (IS) departments, Apple does not have cred, a fact reflected in the diminishing Mac market share.

Hype doesn't buy cred in the IS world any more than it does in the music industry. That's why Windows 95 doesn't yet have cred with corporate IS. Cred has to be earned, the way Windows NT earned it. NT got its foot in the corporate door as a server platform. Now, NT client workstations are everywhere while many IS departments are forbidding Mac servers on their corporate networks — even in all-Mac workgroups.

Can Apple pull off an NT-like strategy for gaining cred for the Mac? Until now, Apple has focused on the client front and left the server battles largely to PC and UNIX platforms. However, Apple will enter the cross-platform-server arena around the end of this year, when it starts selling NetWare for PowerPC, a port of the venerable network operating system to Mac server hardware.

NetWare for PowerPC is clearly aimed at gaining cred among IS types, not Macoholics. The new product completely dumps the Mac OS — which is not multiuser, not crash-proof, and not designed to run as a server OS — in favor of an OS based on NetWare 4.1, which has lots of cred in IS circles.

But Apple will still need to demonstrate some clear advantages of PowerPC hardware over Intel hardware in a server environment. It will also have to calm IS fears about supporting nonstandard hardware. These are daunting tasks, but they're necessary for the long-term success of the PowerPC-based servers.



Real NetWare

NetWare for PowerPC will greatly resemble the NetWare 4.1 running on Intel servers today, right down to the source code on which it's based. It will provide the same basic services as NetWare 4.1: file, print, and directory services; integrated messaging; network management; protocol routing; and security. There will be out-of-box support for Mac, DOS, Windows, OS/2, and Windows NT clients, and the pricing is expected to be the same as for NetWare 4.1. (Apple will distribute NetWare for PowerPC both as a stand-alone package to run on current Apple Workgroup Servers and as a bundle with one or more as-yet-unannounced PowerPC-based servers.)

However, the most crucial factor influencing the success of NetWare for PowerPC will be the number of NetWare Loadable Modules (NLMs) ported to the PowerPC server. The NetWare operating system is a very small, very efficient piece of code surrounded by hundreds of NLMs. NLMs are similar to applications but often perform very low-level tasks.

NetWare 4.1 comes with about a thousand NLMs. An Apple spokesperson told me that Novell is porting most of these NLMs to the PowerPC, including NFS (Network File System, a UNIX standard) and NetWare for Macintosh. However, NetWare for PowerPC may not include all the NLMs that users of Intel systems get, which could hinder the product's acceptance.

Even more important are the NLMs from Novell and third parties that don't come with NetWare but that add important abilities such as e-mail and automated backup. At press time, Apple couldn't tell us whether Novell's add-on NLMs, such as the GroupWise groupware package, would be ported in time for the first NetWare for PowerPC release. Even though a list of PowerPC NLMs wasn't available at press time, Apple claims to have worked with Novell to convince top NLM vendors to port their products. Third parties are willing to port, according to Apple, because the process is not difficult. NLMs written according to Novell specs need only a recompile (as opposed to a rewrite) to run on PowerPC-based machines, and this process generally takes less than a day per NLM.

Improved NetWare?

But even if NetWare for PowerPC does everything NetWare 4.1 does, why would corporate IS departments want NetWare running on anything other than Intel boxes? The most obvious benefit would be raw speed. Apple claims that a Power Mac 9500 with a 120-MHz 604 chip runs 51 percent faster than a 120-MHz Pentium-based PC. With NetWare and its NLMs completely PowerPC-native, the Apple servers should do well in CPU-intensive tasks such as database access and graphics and video serving.

Apple also expects the PowerPC's superior speed to result in a lower CPU-

utililization rate, allowing the server to run more reliably and accommodate more applications and users. IS groups are likely to appreciate these benefits even more than they will the speed itself.

NetWare for PowerPC won't provide any striking ease-of-use advantages over NetWare on Intel. It will have the same command-line interface as NetWare 4.1 and will be administered through Novell's Windows-based NetWare Admin tool. Although Apple says you'll be able to run the Windows administration tools on a Mac with a DOS Compatibility Card or SoftWindows, the Windows requirement will be disappointing for AppleShare fans who want to upgrade their servers. But NetWare for PowerPC isn't aimed at AppleShare owners; it's for NetWare partisans. Changing the interface now would only confuse the people Apple is trying to woo.

Still, NetWare for PowerPC may be slightly easier to set up and administer than NetWare on Intel, because of what Apple claims is better integration with the hardware. Just as drivers aren't much of an issue on Macs under the Mac OS, drivers under NetWare for PowerPC should be less of a hassle than they are on Intel servers.

Credibility Through Standards

A major hurdle NetWare for PowerPC will have to overcome is the reluctance of IS departments to support nonstandard hardware. The PCI bus in the newer Power Macs will help, since it allows the Macs to run the same networking interface cards as PCs.

However, Apple's main weapon here is the Apple/IBM/Motorola common hardware reference platform (CHRP), a standardized PowerPC machine that will be able to run multiple operating systems. No one gets fired for buying an IBM server, and you may be able to buy a CHRP machine from Big Blue as soon as next year. Of course, Apple will have to compete with IBM and the other CHRP clone makers, but it will be competing with a compatible platform.

When CHRP platforms begin shipping, Novell will become the primary distributor of NetWare for PowerPC. For its part, Novell could gain even more credibility than it already has by giving NetWare hardware independence. With the PowerPC added to its platform list and other platforms soon to follow, NetWare takes a big step toward the portability of its competitor Windows NT. On the other hand, it's expected that NT itself will be ported to CHRP by either Apple or Motorola in the near future.

Ironically, the one monkey wrench in the success of the CHRP as a server platform may be Copland, Apple's next-generation client operating system. Apple is rumored to be behind its planned schedule of shipping Copland by mid-1996, and the company may want to delay the CHRP until Copland is ready. Without Copland, Apple won't have a Mac OS to run on CHRP. And a Mac without a Mac OS would definitely not have a lot of cred with Mac users.

Contributing editor John Rizzo is a San Francisco writer and consultant on cross-platform issues and the author of How Macs Work.

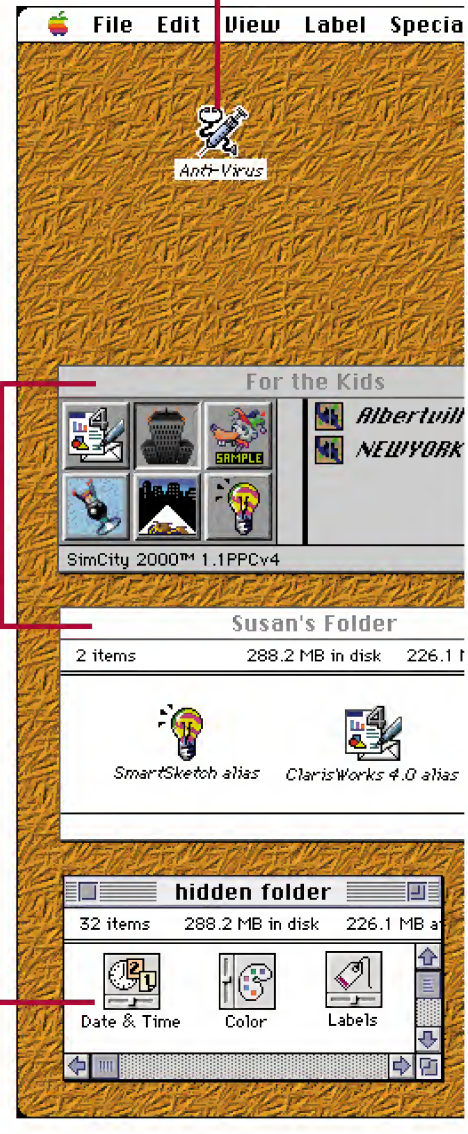
HANDS ON

Defend Your DATA

If casual snoopers are a bigger threat to your Mac's data than corporate spies, try these common-sense techniques before investing in expensive security software.

/ BY GREGORY WASSON

Inexpensive antivirus programs are essential if you exchange files with anyone — friend or foe.



Create personal folders or program launchers for each person who uses your Mac, to limit access.

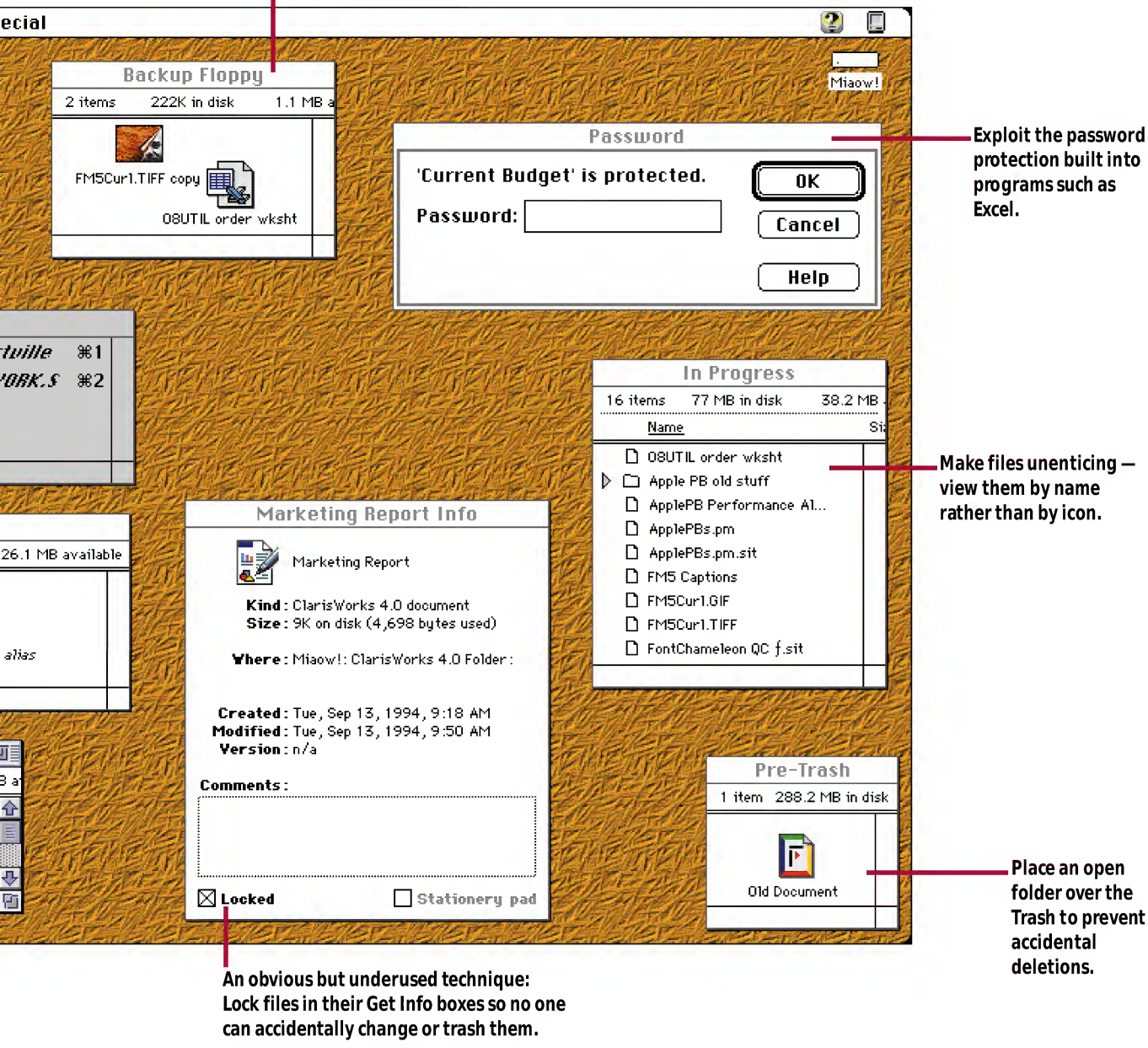
Remove or hide control panels whose settings you don't want others to change.

TOTS TAPPING AND coworkers snooping can alter your Mac faster than Godzilla can wreck downtown Tokyo, leaving trashed documents, a discombobulated desktop, and orphaned files in their wake. The knee-jerk reaction is to call out an army of security software, but before you do, consider the alternatives: some simple techniques that can help keep those desktop- and data-destroying disasters to a minimum. These techniques will help you guard against pilfering intruders and your own mistakes as well.

Back up your backup. Backing up is like flossing your teeth. It may seem like a nuisance at the time, but it will eventually pay off — for instance, the next time someone accidentally trashes one of your important files. Make doing frequent backups an ingrained habit. Take advantage of the automatic-backup features found in some programs, such as FrameMaker and WordPerfect. To be on the ultrasafe side, make backups of your backups.

Inoculate your Mac. If you don't have complete control over the floppies people insert into your Mac or the files that come across the Internet, your Mac may be in danger of a viral attack. Install and keep updated a dependable antivirus utility, such as Virex, from Datawatch, or Symantec AntiVirus for the Macintosh (S.A.M.). Disinfectant is an excellent freeware alternative that is available from online services (see end of article for online-access information).

Divide and conquer. By creating custom folders for the people who use your Mac, you can discourage them from rummaging through all your folders. Place aliases to the programs a person uses in a folder, and teach the user how to save documents to only that folder.



A higher-tech way to achieve the same goal is to use an application launcher such as Square One, from Binary Software (800-824-6279 or 310-449-1481), or DragStrip, from Natural Intelligence (800-999-4649 or 617-876-7680). Launchers let you create customized palettes for giving friends, family members, or coworkers easy access to a selection of specific programs.

Control your panels. A few careless clicks in your control panels can send your Mac time-traveling, reset mouse behavior, or change your desktop appearance so that it no longer feels like your own. You can easily prevent such sabotage by removing relevant control panels from the System Folder. You can place them in another folder hidden a few levels down or put them on a floppy disk and completely remove them from your hard disk. Likely candidates for removal are the Date & Time, Mouse, Color, General Controls, and Desktop Patterns control panels.

Another way to make control panels inaccessible is to disable them. You can do this with Apple's Extension Manager or any other startup manager.

Use the system's padlock. Don't overlook the obvious. The Mac operating system provides an easy way to lock files so they can't be altered or trashed — just click on the Locked check box in the Get Info window of any file you want to protect. It's a little inconvenient, since you have to unlock it to make changes yourself, but it could be a real lifesaver, er, file-saver.

Make a decoy. Accidentally deleting a file is a common mishap. It happens often because trashing a file is so easy on the Mac — especially if you've turned off the alert option in the Trash's Get Info window. To make accidental deletions less likely, leave the alert on or try this: Create a new folder, and call it something descriptive such as Pre-Trash. Drag it to the desktop near the Trash, and open the folder. Make it as small as possible and drag the open folder window over the Trash. Now when you drag a file to the Trash, it remains in the Pre-Trash folder until you drag the folder's contents to the real Trash. Moving the folder off the Trash when you need to throw something away may be a little inconvenient, but you'll have fewer Trash blunders.

Employ a disguise. Icons are eye candy for adults and kids alike. There's nothing as satisfying to a fun-loving youngster or a new user as double-clicking on colorful icons — unless it's seeing Daddy or Mommy in tears because that important budget spreadsheet has been reduced to meaningless ciphers. You can make the contents of any folder less tempting to casual users of your Mac simply by changing the folder's view option to By Name on the View menu.

If you must keep files, folders, and applications on the desktop, where you don't have the option of viewing by name, use aliases rather than the actual icons of files. Also, keep important stuff in folders a level or two down on your hard disk so they're harder to reach.

Protect with passwords. To keep others from deliberately reading those incriminating love letters or confidential financial worksheets, you may want to use programs that have simple password protection. Several popular programs, such as Excel and WordPerfect, keep Nosey Parkers out. Most hard-disk-partitioning software lets you password-protect any volume and any file in it in one easy step. Screen savers such as After Dark generally include at least one module that requires a password before it returns you to the desktop. If you opt for password protection, regardless of the product, make the password random, ideally a combination of words and numbers. Using your own name, that of a pet or a child, or a blank password isn't a good idea. Also, long passwords are better than short ones.

Last-resort security. Still feeling ill at ease? Then you may be a candidate for security software. Before you buy, keep in mind one warning: Most security software is to some degree incompatible with data-compression software, such as Symantec's Norton DiskDoubler, or disk-optimization utilities, such as Speed Disk (part of Symantec's Norton Utilities). You often have to disable the security software when you install new system and application software or when you use hard-disk utilities. Forget and you can kiss your data goodbye.

With that warning in mind, if you use your Mac in a home office, stick with something simple such as Apple's At Ease. It prevents access to the Finder (no more trashed files) and can be used to limit access to control panels and applications.

Users of stand-alone Macs in an office environment will be better served by using more-traditional volume-access and encryption software, such as Symantec's Norton DiskLock.

Don't go overboard. For most individual security needs, the maximum protection necessary is a low-end security-software program. Few people really need the most pick-proof, high-end security software.

Even low-end security software may be overkill. The do-it-yourself techniques described here won't deter determined hackers, but they can be an inexpensive and effective shield against your resident Godzillas.

HARDWARE SECURITY / foiling thieves and power problems

THEFT AND POWER ANOMOLIES can do as much damage to your data as any family member or hacker. To fight these attackers, you sometimes need special hardware. Here are some products we recommend:



The **Comp U Lock One Plus No Drill,** from Versa Lock (800-248-5625 or 818-886-8962), for about $55, is a clever device designed to prevent theft of your computer (and attached hardware peripherals, if you like). It's a set of plates — you attach one to your computer and the other to a surface such as a desk and then lock the two plates together. You can remove them from your equipment and furniture by applying heat. In earthquake-prone areas, it can help prevent damage to your devices by keeping them from dancing across the desk or crashing to the floor.



The **Disk Drive Lock,** from Secure-It (800-451-7592 or 413-525-7039), for about $25, secures your floppy-disk drive with a locked insert. It thwarts those who might put a floppy disk into your Mac to copy and carry away your private files.



An uninterruptible power supply (UPS), such as the **Back-UPS Pro** (starting at around $200), from American Power Conversion (800-800-4272 or 401-789-5735), is a must in areas where the electricity is spotty. These wonderful devices give you 10 to 15 minutes of dependable power when the lights go out — enough time to safely close documents and shut down your Mac properly.

If your problem is too much power rather than too little, what you need is a good surge protector. The **surge protectors from Panamax** (800-472-5555 or 415-499-3900) are noteworthy, because they carry a lifetime warranty that covers repair or replacement of any equipment that's damaged by a power surge when connected to one of the company's protectors. The protectors range in price from around $60 to $130.



Contributing Editor Gregory Wasson is continuously en garde, protecting his data against four mean-looking cats, an adventuresome spouse, and sinister electrical surges.

You can find the shareware and freeware programs referenced in this article in the MacUser and ZD Net/Mac areas on CompuServe and eWorld. See How to Reach Us for instructions on accessing ZD Net/Mac.

MOBILE MAC / BY SHARON ZARDETTO AKER



The PowerBook Gift Guide

The holidays are upon us once more. Treat that special someone to a little PowerBook present — even if that someone is yourself.

MAGAZINE WRITERS LIVE IN a time warp: It's about three months from the time we write something to the time it's printed in a periodical such as MacUser. Once a year, I actually enjoy that delay, because of its perfect timing: I get to gather ideas for the December gift guide during the August Boston Macworld Expo, where everyone is showing off new products. Although I didn't get a chance to give all of these recommended products a thorough MacUser workout, I was able to make sure they all passed some vital points of inspection: namely, each is well made, useful, nifty, not over $100, and — most importantly — something I personally would be willing to pay for based on the information at hand.

Let There Be Light

The backlight on a PowerBook eats up lots of power — especially on a color screen, which takes more light to keep those pretty colors visible. You can try saving battery power by turning your backlight all the way down and holding a penlight between your teeth to shine at the screen. Or you can use the NoteLight ($9), from Interex. This clever little device plugs into the ADB port and snakes its way around the case to shine onto the screen, the way a personal book light directs its rays to the page. Since the power comes from the PowerBook, the light itself needs no batteries. The power draw from the ADB port is less than what the backlight itself uses, so you can save power and look clever at the same time.



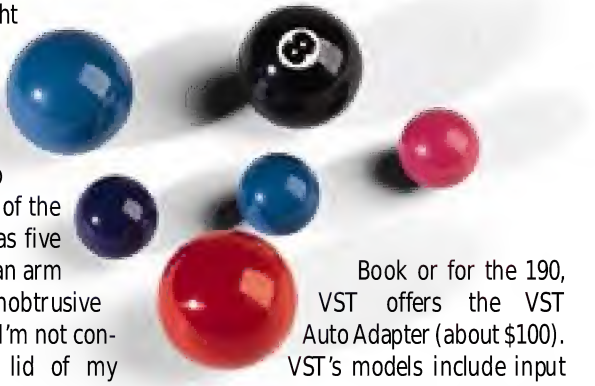
You can also get the NoteLight as part of the PowerBook Compatible Accessory Kit ($25). Besides the NoteLight, the kit includes a portable surge protector and a Copy Clip — a clip you attach to the top of the PowerBook to hold as many as five sheets of paper. You can slide an arm on the clip in and out, so it's unobtrusive when you're not using it. Still, I'm not convinced I want to mar the lid of my PowerBook with a Copy Clip.

Energize While You Drive

Cigarette smoking may not be as popular as it used to be, but now there's another use for the lighter in your car: recharging a PowerBook battery. Just plug in a PowerBook DC converter (you'll probably have to unplug the radar detector), and charge as you drive. Or pull over when inspiration strikes and use your hooked-up PowerBook to compose journal entries without draining any battery power.



Several companies make these converters, including Battery Technology and Lind, but up to now, I've seen only the ones from Battery Network and VST Power Systems. For a 100-series PowerBook (other than the 190) or a Duo, you can get a Laptop Notebook Auto Adapter ($70), from Battery Network. For a 500- or 5200-series PowerBook or for the 190, VST offers the VST Auto Adapter (about $100). VST's models include input transient protection, so you don't have to unplug the adapter when you're starting the car. All models from both manufacturers include an LED to let you know when juice is flowing (most late-model cars don't supply power to the cigarette lighter when the engine's off unless you turn the key to the accessory position).



Have a Ball

A few years ago, I recommended APS Technologies' PowerBalls as a perfect gift for the PowerBook owner. These are fun, colorful trackball alternatives that come in an array of colors, including neon green, bright yellow, mellow orange, or luscious pink. They are

available in all three trackball sizes. APS has recently come out with PowerBalls II, for Duos and models 140 through 180. The new trackballs come in China blue, fire-engine red, moby grape, and a jet black eight-ball design (plain black for Duos). The prices of the original PowerBalls are $5 each or $7 for the variety pack of four colors. PowerBalls II come in variety-packs only, for $13.

Keep It Klean

Don't you just hate it when kompanies spell things wrong on purpose? The names make me wince, but I've been very impressed with Meridrew Enterprises' Klear Screen products: Klear Screen Singles (actually two wipes — one wet, one dry), Klear Screen cleaner (spray-on screen cleaner), and Klear Kloths (lint-free polishing cloths). The cleaning solvents are nonabrasive, nontoxic, and antistatic: just what a PowerBook owner needs. You kan kount on it!

Your Number, Please?

A few months ago, I devoted a column to the problems of dialing up telecom services while you're on the road ("Traveling Telecom Tips," September '95, page 121); what with changes in local access numbers, needing to dial out of hotel phone setups, and trying to use a calling-card number, it's not always easy. I presented all sorts of manual solutions, but now I find there's an automatic one: MegaDial (estimated street price, $80; free 30-day demo version available on various online services), from Cypress Research. MegaDial takes care of everything. Sure, you have to use the control panel to tell it your phone-card number, where you are, and what number gets you an outside line, but that's all you need to do.



No matter what software you're using or where you're logging on, MegaDial intercepts any call you initiate from your PowerBook and uses the information you gave it to dial correctly. It looks up the local access number from its database; turns off the call-waiting feature, if any; and waits for a dial tone so your calling-card number can be dialed. Anything you need to set up in your communications program (and a few things that you might not know how to set up) is taken care of.

Get a Grip

I ran into ZD Net/Mac's chief sysop, Joe Holmes, at the Macworld Expo (well, OK, at one of the after-hours parties), and he took out his PowerBook to show off his wonderful new home page on the Web. The page was impressive, but it was his clever PowerBook accessory that caught everybody's eye. APS Technologies' Grip-It Strips are skinny, textured adhesive strips you can put on the outside of a PowerBook so that when you're carrying it closed, it won't slip out of your hands. Joe says he's not sure whether they've actually made a difference, but he certainly feels a lot safer. You might be able to find them in a local computer store, but they're also available in the APS catalog. A set of granite-colored or teal strips costs $9, and a three-pack of purple, teal, and black strips costs $20.



For the Happy Wanderer

Lots of PowerBook owners subscribe to the backpack philosophy of life, but a briefcase-style PowerBook case looks pretty silly slung on a back. Fortunately, Targus makes a backpack carrier for PowerBooks. The standard $70 version comes in your basic luggage colors (black, burgundy, hunter green, and navy), and for $99, there's also a classy black-leather version. When you want to blend in with the briefcase folks, the backpack straps tuck away, leaving an easy-to-carry handle.

Happy New Year, 500s!

The which-came-first, chicken-or-egg problem of PC Cards (the lack of products is blamed on a lack of customers, which is itself blamed on a lack of products) is finally over, what with the PC Card slots in the newest PowerBooks. So, once the holidays are over and you're ready to get down to serious work, start the year out with a serious purchase for your 500-series PowerBook: a PCMCIA Expansion Module ($219), commonly known as a card cage.

This handy item from Apple Computer will let you use any of the new PC Cards that are poised to flood the Mac market — that is, assuming that the vendors aren't as late with the cards as some people are with holiday cards!



Sharon Aker plans to celebrate the new year by upgrading both her mobile and her desktop computer equipment — even though she may not pay it off before next holiday season.

Directory

Apple Computer
Cupertino, CA
800-538-9696
408-996-1010

APS Technologies
Kansas City, MO
800-235-2753
816-483-6100

Battery Network
Somerville, NJ
800-653-8294
908-534-4630

Cypress Research
Sunnyvale, CA
800-274-6361
408-752-2700

Interex
Wichita, KS
316-524-4747

Meridrew Enterprises
Danville, CA
800-505-5327
510-838-8774

Targus
Buena Park, CA
714-523-5429

VST Power Systems
Concord, MA
508-287-4600

NET TRAVELER / BY MICHAEL SWAINE



Shhh! Online Libraries

Browse the card catalog without leaving your computer — or catch up on great literature online.

YOU'RE LOOKING FOR a book: Vladimir Nabokov's Pale Fire, a relatively obscure novel that appears to be out of print and that no used book store in your area has in stock. Looks like it's time for a visit to the library. Well, the Internet is a library, right? But if the Internet is a library, you say, where's the card catalog? Among the many differences between the Internet and a traditional library (libraries usually aren't open all night, they smell musty, you're supposed to be quiet), one stands out: A library usually has one card catalog, but the Internet has thousands. Some of these catalogs are collections of other sites: one self-appointed Net librarian, John Makulowich, maintains an awesome list of libraries and other such reference-oriented Web sites at http://www.clark.net/pub/journalism/awesome.html. Or try the excellent WWW Virtual Library, at http://www.w3.org/hypertext/DataSources/bySubject/Overview.html.

Libraries on the Web. Eventually you discover Libweb, a directory of libraries and library-related information, at http://www.lib.washington.edu/~tdowling/libweb.html, where you learn just how many libraries have ventured into the electronic realm. An excellent university-library Web site can be found at Indiana University (http://www.indiana.edu/~libweb/index.html). Borrowers can renew books over the Net and submit interlibrary-loan requests. From this site you can also search other library catalogs throughout the world. You also find that lots of public libraries are online. The size of a site's hometown doesn't seem to have much to do with the quality of its online libraries. The excellent Santa Cruz, California, Public Library page at http://www.cruzio.com/~sclibs/ includes information about local events and government, as well as searchable stacks.

At the city library of Provo, Utah (http://www.provo.lib.ut.us/), it's easy to get confused about what's actually in the library and what's elsewhere on the Net. Distinctions such as this, you realize, are becoming less and less important.



Finding the Books. After a while you find out that there really are books on the Net. While browsing the stacks at http://english-server.hss.cmu.edu/, also known as the English Server at Carnegie-Mellon University, you pick up The Raven and dive into Poe's lush verse. And here are Goethe's Faust, Fielding's Tom Jones, and more.

You finally find Pale Fire at the public library of Charlotte & Mecklenburg County in Charlotte, North Carolina, at http://www.plcmc.lib.nc.us/. This is one of the best library Web sites around. True, the clear and attractive Web interface degenerates into clunky Telnet when you access the card catalog, but you're getting used to that by now. (Some institutions, such as the Library of Congress at http://lcweb.loc.gov/z3950/gateway.html, are experimenting with web-based card catalogs.) You learn, to your delight, that there are four copies of Pale Fire currently on the shelves. You can reserve a copy now, although you do need a library card — a trifling detail. Then you just drop by the library and . . . . What? You have to, like, go to North Carolina? What a startling intrusion of reality into your virtual search this is! Better ask about interlibrary loans.

Tip of the Month

If you return to a particular Web page frequently — say John Makulowich's Awesome List — try saving it to your hard disk. In Netscape Navigator (other browsers can also save pages locally), select Save As, choose Source as the format, and name the file you're creating. The next time you want to visit this page, choose Open File from the File menu and view the page locally. Graphics won't be displayed; links won't work unless you're online; and of course, you won't see any changes John has made to the page since you downloaded it. But you will have a reference point, and you'll have saved some time on your Web walk.

Don't Know ftp from ftd?

MacUser maintains a list of frequently asked questions (FAQs) about the Internet, MacUser itself, and this column specifically. Send mail to faq@macuser.com. MacUser's address on the World Wide Web is http://www.macuser.ziff.com/~macuser/. You can reach me at traveler@macuser.com.

BY CHRISTOPHER BREEN AND BOB LEVITUS



Help Folder

A mysterious morning-only backup problem, an unusual ergonomic device, and the pros and cons of clock-chip accelerators.

Backup Blues

Q. My backup system (an APS DAT drive and Retrospect software) seems to work only first thing in the morning. After I've done a full day's work, the backup software freezes when I try to run it.

I've tried everything to fix it — restarting my Mac before backing up; leaving the tape drive on; leaving the tape drive off; moving the tape drive to a different location, in case it's getting too hot. Nothing seems to work except the morning backup.

Wendy Kuhn
Fort Worth, TX

BOB: Because the problem occurs only late in the day — which, not coincidentally, is when your Mac and its peripherals and connectors are literally "warmed up" — I think you have a hardware problem.

CHRIS: Nailed it, Bob. The fact that Wendy has restarted prior to the failed afternoon backup attempt clinches it.

BOB: The reason you see the problem only late in the day is because, when your components warm up, they expand ever so slightly. This can cause a failure in the SCSI chain, at any connector or in any cable.

All you probably need do is replace the SCSI cable that's causing the trouble. If you have multiple SCSI devices, temporarily disconnect all but the DAT drive, to make troubleshooting easier.

WRITE TO HELP FOLDER/TIPS

c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404

Don't want to wait for an answer? Post your question on ZD Net/Mac, MacUser's online service, or send e-mail to helpfolder@macuser.com or tips@macuser.com. We pay $25 to $100 for any undocumented tips we publish.

If installing a new cable doesn't help, you probably have a bad connector on the DAT drive. Contact APS' tech-support department for further instructions.

CHRIS: For others who are experiencing crashes and freeze-ups regularly after a full day's work, the cause may not be hardware-related. Rather, the problems can be caused by running a passel of programs that set your Mac up for an eventual fall. If you haven't already done it (as Wendy has), try restarting your Mac to fix the problem.

The Pain of Wrist Strain

Q. If I have to use a program that's mouse-intensive for more than a few minutes, I get a serious pain in my hand and wrist that lasts for days.

System 7's Easy Access control panel helps, but it's really tedious pressing the arrow keys over and over to move the cursor just a little. Besides, it disables my number pad and must be reenabled each time I start my Mac. Do you have any other suggestions for RSI (repetitive-stress injury) sufferers?

L. Brockmann
via America Online

CHRIS: Well, L., it all depends on the severity of your injury. If you want to stay completely away from clicking and tapping devices, look in the January '95 issue for an article entitled "The Easy-Access Mac" (page 119). The article offers plenty of solutions for those with physical limitations.

If your condition is less severe — and considering you're able to use Easy Access, I assume that it is — I can recommend something that may not only help your pain but also cheer you up in the meantime. I'm speaking, of course, of Kernel Productions' ChoiceStick (about $70).

BOB: Wait a minute, I could swear that's a gaming device I was considering reviewing for The Game Room.



figure 1 / **Designed for game playing,** the ChoiceStick can also give relief to RSI sufferers. Its control panel lets you program game devices to move the cursor and perform a variety of functions, such as emptying the Trash, with just the click of a button.

CHRIS: Right you are, Bob. The ChoiceStick is an adapter for Sega and Atari game controllers and joysticks. Although these game devices are normally used for blasting electronic enemies, they can also help cut back on the kind of repetitive mousing that inflames injured appendages.

You can, of course, hook up a Mac game controller, but the ChoiceStick adapter gives you access to game controllers that typically have more buttons than the Nintendo-style game pads used by most dedicated Mac game controllers. For RSI sufferers, the more programmable buttons, the better, because they don't have to use their injured hands as much.

Not only do you get more buttons out of the deal (see figure 1) but the ChoiceStick's control panel also triples the number of functions of a game controller by letting you assign three separate functions to each button — for instance, one press can bring up an Open dialog box, two presses can click on Open, and three presses can click on Cancel.

Oh, and it's fun to use with games too.

BOB: I had some wrist pain last year, so I bought a pair of articulated arm holders that clamp onto my desk and support my forearms as I type. They helped, but they

weren't cheap — they ran about $200.

Another thing I've had success with is a pair of Handeze Energizing and Therapeutic Support Gloves. (I get mine from APS Technologies, for about $20.) They work better than I ever expected.

Last but not least, instead of a mouse, I use a trackball, because it seems to relieve strain.

A Chip off the Old Clock

Q. Ads say "clock chippers" accelerate your Mac, but I'm wary. Do you think installing one is a good idea?

Tracy Lupher
via the Internet

CHRIS: Let's start with the basics: These chippers are doodads that clip onto the clock chip of your Mac, pumping up the clock rate. For instance, a 66-MHz Power Mac 6100 could conceivably operate at 90 MHz. For the speed boost you get, they're cheap, starting at around $75 from vendors such as Newer Technology.

BOB: Sure they're cheap and they do speed things up, but your wariness is warranted, Tracy. Boosting the clock speed puts additional strain on your computer's main processor, which translates into excess heat.

CHRIS: This heat can prove deleterious to your Mac's finer feelings, and Apple would just as soon not replace processors that have been reduced to a pile of molten goo. I've never heard of that happening, though. In fact, to prevent processor damage, most chipper vendors include small fans that draw heat away from the main processor.

Besides, if the processor gets sizzled, you can always feign ignorance with the "How'd that happen?" look. Raise your eyebrows, bug your eyes out a bit, and let your mouth flop open like that of a spotted grouper. This look is handy not only for computer-related problems but also for automobile mishaps and misunderstandings in relationships.

Unfortunately, there's no predicting whether a chipper will work at all in your Mac. As much as we would like to assure you that all Macs are created equal, it's just not so. You can take two identical Power Macs off the shelf and crank both up to the same blazing speed with identical chippers, and one will work flawlessly while the other crashes before the first extension loads.

Last, a warning for Power Mac 6100/66 users: Your Mac has a Level 2 cache card not found on the 6100/60. This cache card can be mighty finicky about having the clock rate excessively messed with — it was designed to work at 66 MHz, and once you go beyond that, the results are unpredictable. In a real-world test, I had the best success when I replaced the original cache card with a third-party Level 2 cache card designed to work beyond the 66-MHz limit.

BOB: I wouldn't dream of putting a chipper in my Mac. Sure they're cheap, but a logic-board replacement isn't.

CHRIS: I know of more than a couple of savvy Mac users who swear by them. On the other hand, chippers are so new that we have no idea what long-term damage your processor may or may not suffer.

Drubbing Pub-and-Sub

Q. I use System 7's publish-and-subscribe feature to create a spreadsheet of summary data from data in several other spreadsheets. It works fine on my PowerBook, but when I transfer the files to my IIci, the main spreadsheet can no longer find the published data from the other spreadsheets. How can I make it work on both machines?

Gregory Welch
via the Internet

CHRIS: I have two ideas: one obvious and tiresome and the other sneaky and complicated. Before I reveal them, a little background is in order.

Publish-and-subscribe, for the 98 percent of you out there who have never used this System 7 innovation, lets you link two or more documents. Every time you make a change to the document designated as the publisher, linked documents, or subscribers, automatically update to include those changes.

The tricky part is that pub-and-sub locates files based on the original pathname — it knows that publisher document Gorgo and subscriber document Son of Gorgo are in the Rubber Monster folder on the Worthless Data disk, for example. Once you move Gorgo and Son of Gorgo to another volume, the pathname is no longer the same and the documents are essentially lost.

Solutions? We got 'em! The really obvious

TIPS / Microsoft Word

POWER INDEXING

Here's a way to include every occurrence of a particular word in an index in just a few steps in Microsoft Word 5.1 (you can do it automatically in Word 6, with the Mark All feature):

Select Replace, on the Edit menu, and enter the word you'd like to index — LAN, for example — in the Find What field. Now enter that word twice with the characters .i. in the middle and a semicolon at the end (LAN.i.LAN;) in the Replace With field. Click on the Replace All button.

Use the Find and Replace command again, this time finding .i.LAN; and replacing it with the same characters (.i.LAN;) in hidden-text format (from within the Replace dialog box, select Character from the Format pop-up menu; then check the Hidden check box). Again select Replace All.

Your key index words are now properly formatted and ready for Word to start building the index.

Kirk Maule
London, England

TIPS / Power Mac



CRAMPED UPGRADE CARD

I've discovered that the case of an LC is intended to support a maximum of 35 pounds. Anything heavier causes the top of the case to bow slightly inward. Normally this isn't a problem, but when I installed a DayStar Power Mac upgrade card — the PowerCard 601 — in my LC 475, put my monitor on top, and let my cat Shadow jump up on the case, my machine froze. When I tried to restart, my Mac played the chimes of doom.

A bowing case puts pressure on the upgrade card, which nearly touches the top of the LC case, and can cause the Mac to lock up.

All I had to do to fix it was open the case and jiggle the card. My tip? Avoid the trouble I had by making a monitor stand out of a couple of two-by-fours and a hunk of plywood, and place it over your Mac.

Bart Farkas
Alberta, Canada

TIPS / Power Mac

IDENTIFY NATIVE APPS, I

Here's a way to tell whether or not an application is PowerPC-native:

Highlight the application's icon, and choose Get Info (Command-I). If you see a note at the bottom of the Get Info window regarding virtual memory (or RAM Doubler, if it's installed), the application is native. If it's non-native, you'll see just the standard Get Info box.

Alex Rampell
via America Online

IDENTIFY NATIVE APPS, II

To find out if an application is native, highlight the application's icon and press Command-Option-Shift-I. If the dialog box that pops up lists programmers who helped with the 680x0-to-PowerPC transition, then you have a native app. Non-native apps display only the standard Get Info box.

Junius Gunaratne
Moorhead, MN

and tiresome way around this is to link the documents again by republishing and resubscribing. Just follow the usual pub-and-sub procedures on your desktop Mac, and you're done. Ho hum.

The sneaky and complicated solution — and the one that will save you time only after you've performed the task hundreds of times — is to make the pathname on your desktop Mac the same as that on your PowerBook. Assuming that you have a common file and folder hierarchy on the two machines, rename the disk on your desktop Mac to match that of your PowerBook disk.

BOB: So it's sneaky — but complicated?

CHRIS: No, wait — here's where the beautiful part comes in. You can create a macro that renames your desktop disk as well as opens your pubbed-and-subbed documents. When you've finished your work, fire off another macro that closes the program and then switches the disk's name back again. Tweaking the macro to make it work properly can take hours!

Virtual-Memory Debate

Q. I have a Power Mac with 8 MB of RAM. Is there any advantage to installing Connectix's RAM Doubler as opposed to turning on the Mac's virtual memory?

Marty Klatzko
St. Paul, MN

BOB: I recommend RAM Doubler for two reasons. First, based solely on personal experience, I'd be willing to bet RAM Doubler is faster than the Mac's virtual memory.

Second, RAM Doubler doesn't claim any space on your hard disk until it needs it. When it does need space, it grabs only as much as it needs and grabs it only temporarily. The Mac's virtual memory, on the other hand, creates a swap file on your hard disk equal to the size of your installed RAM plus your virtual-memory allocation. That space is unavailable for anything else whenever virtual memory is turned on.

Best of all, RAM Doubler doesn't seem to affect the performance of any of my programs, even the notoriously virtual-memory-averse Photoshop.

CHRIS: Power Mac owners win no matter which of the two virtual-memory options they choose — the one that comes with Macintosh system software or RAM Doubler. That's because native applications require less memory when you're using either of these types of memory than when you're not.

If I had to make a choice, I'd go with RAM Doubler for the last reason Bob mentioned: There are certain applications that, while sneering viciously in the presence of Apple's virtual memory, purr like fuzzy pussycats with RAM Doubler installed.

Best View on the Desktop

Q. When I set folders to View by Name mode — who can stand anything else? — in the Finder, all my icons turn generic. I've tried reinstalling system software, rebuilding the desktop, and zapping the PRAM about a gazillion times. And I've tried to fix it with TechTool, Save A BNDL, and BNDL Basher — all to no avail. Is there any kind of cure?

Anne Hill
Sebastopol, CA

BOB: The cure is simple . . .

CHRIS: . . . if, perhaps, elusive.

BOB: Even the power users I quizzed couldn't figure it out right off the bat.

You've probably chosen the smallest icon size in the Views control panel. To make your icons show their true colors once more, choose the middle or large icon size.

CHRIS: There is a good use for that smallest-size icon setting — I often run my color PowerBook in black-and-white mode, and two-toned icons are just this side of useless. Also, the smaller icons eat up less of the PowerBook's precious desktop space.

The Fury of Sound

Q. I was told by Apple that I could not hook up an ordinary microphone to my Power Mac, since the microphone jack is powered. What good is 16-bit stereo input if I can't get at it?

Aaron Greenberg
via the Internet

CHRIS: It's true; you cannot use a standard microphone with the sound-input jack on the Power Mac, as well as on several other Macs, such as the PowerBook 500 series and the Quadra 660AV and 840AV. They have a PlainTalk input, and it works only with a line-level signal (the kind found on cassette decks and VCRs) or with a PlainTalk microphone. Plugging a regular mic into that jack won't hurt anything; it just won't work.

The PlainTalk mic has a plug that's a quarter of an inch longer than a standard miniplug. When you insert the PlainTalk mic's plug into that jack, it makes contact with a powered connector. Contact with the powered connector gives the PlainTalk mic the juice it needs to operate correctly. Standard-length miniplugs can't reach the connector, and for good reason. If they used the extra boost of juice, it would be too much.

The only way to use a regular mic with the PlainTalk input jack is to run the mic through a preamp (a device that adjusts the mic's signal). You can do this by plugging the mic into a sound-mixing board, since it comes with a preamp, and then plugging the mixing board into the Mac's sound-input port. You can get mixing boards at electronics stores, such as Radio Shack. The cheapest one costs around $35, but to get a good one, expect to spend around $300.

BOB: The cheapest way to go is to use a PlainTalk mic for voice input. If you don't already have one, you can pick one up from Apple for under $40.

Bob LeVitus is the director of evangelism for Power Computing. Christopher Breen is a San Francisco Bay Area musician who suffers from LWAS (Lloyd Webber Aversion Syndrome).

You can find the shareware and freeware programs referenced in this article in the MacUser and ZD Net/Mac areas on CompuServe and eWorld. See How to Reach Us for instructions on accessing ZD Net/Mac.

Don't Let Them Eat Fruitcake

Sick of fruitcakes, Chia pets, and neckties? Andy's gift guide is guaranteed to satisfy the Mac user in your life—even if you have to treat yourself.

BY ANDY IHNATKO

IT'S A COZY, winter-wonderlandish holiday evening. Mom's in the kitchen, doing what she does best: scrutinizing acres of data on her PowerBook, calculating long-range projections of the spot metals market for her investment firm. Dad's in the den, trying to get the holiday lights to work. After two hours of frustration, he will finally determine that it's his scanner refusing to relinquish the serial port, and after a restart and a brief prayer, he will be rewarded by seeing his modem's "OH" and "CD" lights finally come to life. He will indeed be able to log onto America Online and have a basket of exotic cheeses sent to his mother overnight. And Junior's in his bedroom, snuggling up close to his Performa, looking for saucy images on the Web, sugarplums of a decidedly different sort dancing in his head.

Well, Norman Rockwell it ain't, but these are the '90s, after all, and the members of this family should be thankful that on Christmas Eve they're even in the same house together. And the following items aren't exactly a Red Ryder Pump-Action BB Rifle with a compass in the stock either, but they're nonetheless likely to float the boats of the Mac-heads on your gift list.



YOU'LL NEVER throw away another file again once you have an **Iomega Zip** ▲ removable-cartridge drive connected to your Mac. When you can buy a 100-MB cartridge for $19, I mean, why bother throwing out all of those Word Settings (x) files? Sure, its technology may be less durable than that of other cartridges, but with a drive that's priced to move at $199, most people won't care one bit. 801-778-1000.

FOR FUN WITH FIGURES, try Fractal Design's **Poser** ▶ ($199), which does for the human figure what KPT Bryce did for planets and terrain. Giving you a variety of basic human models you can customize and then pose in lifelike (or unlifelike) positions, it's not only a useful thing to have in your graphic-design tool chest but also loads of fun to play with. Noodling around with Poser will bring you right back to those days of your youth when you spent hours on the living-room floor with your Barbies. GI Joes. I meant to say GI Joes. 408-688-8800.



PHOTOGRAPHY / MICHAEL FALCONER



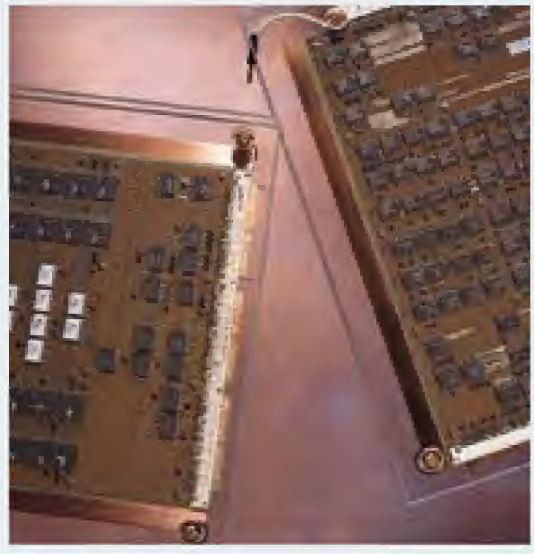
WHAT DO NEWTON MessagePad 100 owners envy most of all about the more sophisticated 110 and 120 models? Not the additional memory or the longer battery life but that snazzy built-in lid that protects the screen. Envy no more, with a snappy **Flip-Lid Classic** ▶, from The MODELSHOP. Made of sturdy black aluminum, it installs (and removes) in seconds with the use of miracle Velcro technology, and its double hinges allow it to serve as a convenient angled stand. Available from PDADirect, 800-279-4732 or 219-882-5228, for $39.95.

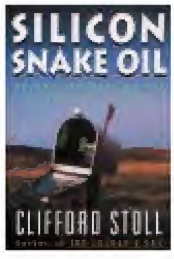


LET'S BE FRANK: The World Wide Web caught everyone by surprise. There we were, secure in the knowledge that our V.32bis modems were plenty fast for anything an online service wanted to throw at us, not knowing there were nefarious plans afoot to create an infrastructure for live multimedia via the Internet. Unless you want to wait all day for that live image of a coffeepot in Stuttgart, a 28.8-kbps modem such as the **Global Village Teleport Platinum** ▲ ($279) is in your future. 408-523-1000.

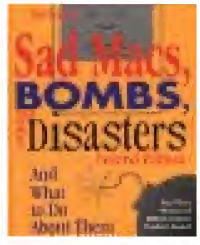
Parts for Art's Sake

CHEER UP. Just because you're a computer geek doesn't mean you can't appreciate the finer arts. But when dressing up a dreaded office or apartment, shun those gaudy and overpriced Renoirs, Chagalls, and Lichtensteins in favor of an actual memory or logic board from a Cray 1 supercomputer, lovingly mounted in space-age acrylic for a lifetime of viewing pleasure. They're $199 and $249, respectively, and are available from Tony Cole, at MemoryBilia Computers. 510-881-1772.









UNTIL THE EVIL SCIENTISTS of the world perfect cold-fusion power supplies for notebook computers, there will always be those awkward moments when you'll have to shut down your PowerBook and pick up a book instead. Be prepared with one of these fine titles at the ready: **Silicon Snake Oil,** a wonderful cautionary essay about the Internet; **Microserfs,** by Douglas Coupland, a taut novel about Microsoft programmers who flee the mother ship to seek their fortunes; and MacUser contributing editor Ted Landau's **Sad Macs, Bombs, and Other Disasters,** the hardware- and software-troubleshooting guide that ought to ship with every Mac.

Ammunition Not Included

KWIK KWIZ TIME, KIDS! What's exactly 3.5 inches high? That's right: the Army's S9JNA field-rocket ammunition! Those little babies helped keep the peace during the Cold War . . . now the sturdy (and I'm talking sturdy) rope-handled crates they were shipped in can keep an eye on more than 600 of your floppies. Angry military stenciling and superdense wood say "No" to would-be master-disk pilferers, with a capital "Nyet!" Just $10 from American Science & Surplus, whose catalog is a pretty good gift in itself. 708-982-0870.

WAIT A MINUTE! Still shoving that tired old mouse around? Spinning your wheels in squaresville with a trackball? Get hep to the scene, Daddy-o, with the **ALPS GlidePoint** ▶ touch-cursor device. Using the same technology as the trackpads in the PowerBook 500 series, the GlidePoint ($99) offers surprisingly fine, smooth cursor and pointer control in a device that fits in the palm of your hand or in a corner of any keyboard. 800-950-2577 or 408-432-6000.



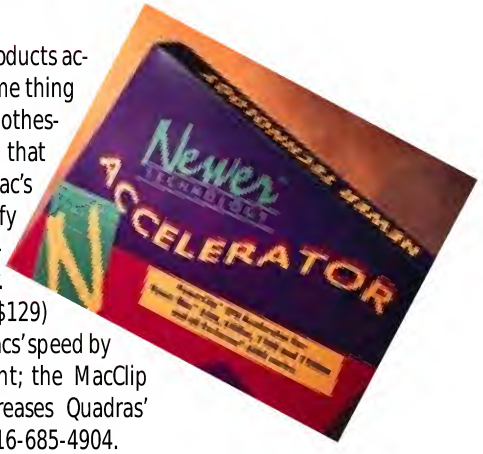


PARANOID? ME TOO, so here's the ultimate in data security, courtesy of Man & Machine, Inc.: the **InvisiView** — a special modification to your PowerBook that makes the contents of its screen completely invisible to everyone in the room but you . . . provided you're wearing your special lightly tinted InvisiView spy sunglasses. When you've made it back to C.O.N.T.R.O.L. headquarters, a snap-on screen filter restores the screen to normal operation. $295, plus the cost of shipping your PowerBook to Man & Machine for installation. 301-277-3760.

DO THE LUCKY FOLKS on your shopping list need a color printer? Unless they want to supplement their scholarships by selling fake IDs to underage classmates, probably not. But color printers are dang fun nonetheless, and there's no easier way to get toddlers to pick up lucrative Photoshop skills than to promise them color output. And these days, you can find color printers that are as cheap, crisp, and easy to run as monochrome inkjet models. The **Apple StyleWriter 2400** ◀ ($525 list) isn't the cheapest color printer available, but its ColorSync software makes it one of the most accurate. 800-538-9696 or 408-996-1010.



PEOPLE WITH POWER MACS and a thirst for speed are usually familiar with the concept of "chipping": yanking out the clock crystal that the Mac came with and substituting a faster one, resulting in a serious speed boost for frighteningly little money. Also more than a little frightening, however, is the prospect of performing that sort of delicate surgery by yourself. The **Newer Technologies PowerClip** ▶ and **MacClip** products accomplish the same thing with a small clothes-pinlike device that clips over your Mac's oscillator in a jiffy and can be removed as easily. The PowerClip ($129) boosts Power Macs' speed by up to 33 percent; the MacClip (also $129) increases Quadras' by 40 percent. 316-685-4904.





QUICK, WHAT'S THE DIFFERENCE between a Galaxy- and Constitution-class starship? Where is Starfleet Academy's Flight Range located? Which Star Trek episode did Joan Collins appear in? If your kids don't know all this stuff, then for heaven's sake, buy them the **Star Trek Omnipedia** ▲ CD-ROM ($79.95) before their classmates' heartless taunts of "boch ghlchraj!" cause deep emotional scars. With voice input and output and scads of video clips and stills illustrating practically every aspect of the Trek universe, the Omnipedia can bring almost anyone up to warp speed in no time flat. Simon & Schuster Interactive, 800-983-5333 or 310-793-0600.

Roll DIMMBones

DO YOU OWN A POWER MAC 9500? We all hate you. Are you whining about the cost of memory too? We hate you even more. We are also duty-bound, however, to call your attention to the adapters offered by SIMMSaver Technology and Newer Technology, called, respectively, the DIMMSaver ($79) and the DIMM Tree ($68). These nifty gewgaws allow two 72-pin SIMMs to take the place of one 168-pin DIMM. For the proletariat, SIMMSaver also offers adapters for using several old 30-pin SIMMs to take the place of a single 72-pin SIMM. For those who feel that giving such a thing to your sweetheart is like buying him or her a cubic zirconia, real memory is the gift that lasts forever (or at least until the next change in memory-module design). 800-636-7281 or 316-264-2244.

FINALLY, WHAT COULD BE A BETTER GIFT than a getaway vacation for two to explore submerged ruins? But don't worry about getting your SCUBA certification, because you'll be winging your way to balmy **Logan, Utah** ▼, site of the landfill where Macintosh history — in the form of 2,700 Apple Lisa computers dumped there in 1989 to give Apple a huge tax write-off — is buried. The tourist potential of this attraction has never been exploited, so you won't be gouged by area hotels (the Center Street Inn, 801-752-3443, has rooms reasonably priced from $55 to $130 a night) and restaurants. For the true Macintosh fanatic, this sacred ground beats a Civil War battlefield any day.



The Two Dads

BY RIK MYSLEWSKI AND JIM SHATZ-AKIN

JIM: The days are getting shorter.
RIK: The lines at Toys 'R' Us, longer.
JIM: It's that time of year again.
RIK: Kwanza. Hanukkah. The solstice.
JIM: Christmas.
RIK: Holidays. Family. And the annual appearance of that time-honored holiday tradition: rank commercialism.
JIM: How convenient of you to mention rapacious greed. Gives me a chance to vent.
RIK: Here it comes: Daddy Jim's character-licensing rant.
JIM: Well, it bugs me that some software publishers want you to shop for software just like you do for breakfast cereal.
RIK: What's wrong with well-known fuzzy friends who induce a child to fall under the spell of an educational message?
JIM: Nothing. Trouble is, though, most kids' software based on popular characters is downright crummy. Disney's **The Lion King** lumbers immediately to mind.
RIK: You're right, there. Slapdash animations. Tedious games.
JIM: Turner Interactive's **The Pagemaster** is a little better but is still underwhelming. Choppy performance. Film clips with sound tracks that don't sync up right.
RIK: In past months, you've complained about ImageSmith's weak **Yearn 2 Learn Peanuts** and **Yearn 2 Learn Snoopy** titles and Big Top's snoozy **Hello Kitty** series.
JIM: A lethargic litany of licensed lousiness.
RIK: But aren't you being a bit negative for this happy holiday season? Familiar TV and movie characters don't always mean wretched software. E*A Kids' **Sesame Street Letters** lives up to its PBS ancestry, and **Big Top's Cartoon Toolbox Starring Felix the Cat** lets kids have a blast making their own cartoons.
JIM: OK, I'll temper my rant. Parents shouldn't shun all Hollywood software, but they should definitely approach with caution if there's a popular character on the box.
RIK: More to the point, the best software stands alone — it doesn't need characters from movies or TV.



JIM: Let's give some examples from the best of the upcoming releases. They're not out yet, but you can be sure most of these will appear in stores well before that last mad holiday buying rush.
RIK: As sure as there's an "X" in Christmas.
JIM: For example, look for MECC's **Maya Quest** — an inquiry into the disappearance of the Mayan civilization, for ages 10 to 16. And don't miss Theatrix Interactive's **Bumptz Science Carnival** and **Snootz Math Trek;** they're fun exploration and skill-drill games for kids in primary school.
RIK: I'd elevate Bumptz and Snootz from merely fun to downright hilarious. And for more holiday merriment, check out **Pantsylvania,** Headbone Interactive's trek through a trouser-centric town.



JIM: Bad puns forever! For kids below the age of pun-sentience, have a look for **My Make-Believe Castle,** from LCSI; **GeoSafari Multimedia,** from Educational Insights; and **Jack's House,** from Kids Count Entertainment.
RIK: Finally, being a shameless fan of most Edmark software, I'll bet that **Thinkin' Things Collection 3** and **Trudy's Time and Place House** — the newest offerings in the excellent ". . . Things" and ". . . House" series — will join my all-time favorite-gift list.
JIM: Speaking of all-time favorites, shall we list a few?
RIK: Better yet, let's wash down a couple of pieces of Hanukkah gelt with some fortified eggnog and indulge in that great — if embarrassing — holiday tradition: caroling.
JIM: You don't mean . . . ?
RIK: Yes. Software in song. You at home, gather the kids by the fire and join in.
JIM: Are you sure you want to do this?
RIK: Trust me . . . .

Dads' Gift Directory

Rated products

Earth Explorer ★★★★½ (ages 10 and up; CD-ROM; list price, $99), Claris, Santa Clara, CA; 408-987-7000.
Elroy Goes Bugzerk ★★★★ (ages 7 – 12; CD-ROM; list price, $50), Headbone Interactive, Seattle, WA; 206-323-0073.
Big Top's Cartoon Toolbox Starring Felix the Cat ★★★★ (ages 7 and up; CD-ROM; list price, $55), Big Top Productions, San Francisco, CA; 415-978-5363.
Jack's House ★★★½ (ages 2 – 8; CD-ROM; list price, $40), Kids Count Entertainment, Evanston, IL; 708-272-9766.
The Lion King ★★½ (ages 3 – 9; CD-ROM; estimated street price, $40), Disney Interactive, Burbank, CA; 818-543-4300.
Math Workshop ★★★★ (ages 6 – 10; CD-ROM; estimated street price, $40), Brøderbund, Novato, CA; 415-382-4400.
The Pagemaster ★★★ (ages 6 – 12; CD-ROM; list price, $50), Turner Interactive, Atlanta, GA; 404-885-7972.
Sesame Street Letters ★★★★ (ages 3 – 6; CD-ROM; estimated street price, $40), E*A Kids, San Mateo, CA; 415-571-7171.

Other recommended products

Bumptz Science Carnival and **Snootz Math Trek,** Theatrix Interactive, Emeryville, CA; 510-658-2800. **GeoSafari Multimedia,** Educational Insights, Dominguez Hill, CA; 310-884-1931. **Living Books** series, Living Books, Novato, CA; 415-382-7818. **Maya Quest,** MECC, Brooklin Park, MN; 612-569-1500. **My Make-Believe Castle,** LCSI, Highgate Springs, VT; 514-331-7090. **Pantsylvania,** Headbone Interactive, Seattle, WA; 206-323-0073. **Reader Rabbit** series, The Learning Company, Fremont, CA; 510-792-2101. **Thinkin' Things** series and . . . **House** series, Edmark, Redmond, WA; 206-556-8484. **Wiggleworks** series, Claris, Santa Clara, CA; 408-987-7000.

It's a Children's Software Wonderland (to the tune of "Walkin' in a Winter Wonderland")

Holidays! Time for giving,
And extravagant living.
For kids on your list,
Not ready for **Myst**,
It's a children's software wonderland.

There are games that'll teach 'em.
Play's a great way to reach 'em.
Math Workshop is fun;
It's from Brøderbund,
A top kids' company in wonderland.

Thinkin' Things are tons of fun to play with.
We like each collection: 3, 2, 1.
Captivate your kids (if they're creative),
'Cause only teasing siblings is more fun.

Claris software's top-drawer,
Wiggleworks, Earth Explorer,
And Headbone's **Elroy,**
That bug-lovin' boy,
Will chase his dog through software wonderland.

(Instrumental break. Kazoos, jugs, and nose flutes are all acceptable.)

Reader Rabbit's cloying but successful,
When it comes to teaching kids to read.
Living Books are clever and less stressful,
But cutesy Rabbit gives kids what they need.

Keep this one rule in mind,
When kids' software you're buyin',
"It's got to be cool,
And more fun than school,"
Then your kids will learn in wonderland;
Mousin' 'round in software wonderland;

It's a —
Children's software —
Wonderlaaaaaand!

RIK: There. Was that so bad?
JIM: Yes.

The Game Room

BY BOB LEVITUS

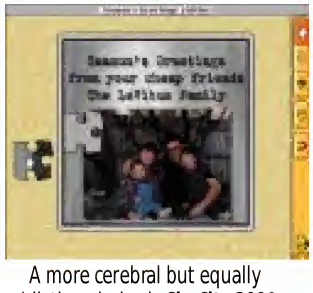


IF THE BEST GIFTS are those that go on giving, then computer games are clearly the gift of choice for everyone on your holiday list, right? All you need to do is match the right games to the right loved ones — or not-so-loved ones, since a really good game can also get less favorite folks out of your hair for months.

For Your Beloved

My motto is, "If you really love 'em, give 'em something addicting." That way, you'll always know where to find your Mac-enslaved sweetheart.

For puzzle lovers, check out **Jigsaw-It!** ▼ (★★★★; list price, $58 on CD-ROM, $48 on floppy), from Dynaware (415-349-5700), with over 100 puzzles plus the ability to make custom puzzles from any PICT file that fits your beloved's tastes — such as, say, a scanned-in photo of you looking your cutest. While you're cranking out custom puzzles, you can also make self-running greeting-card puzzles and send them to all your Mac-owning friends — a nifty and thrifty gift, since all you need is a floppy disk (all those extra AOL disks are perfect).



A more cerebral but equally addicting choice is **SimCity 2000** (★★★★½; list price, $50 on floppy, $70 on CD-ROM), from Maxis (800-336-2947 or 510-254-9700). More than a game, SimCity 2000 is a sophisticated city simulator; addicts have been known to spend months modeling a single city. The player controls everything from power to buildings to water (but not natural disasters), so it's a great way to satisfy your beloved's thirst for power outside of your relationship.

For stressed-out significant others in need of a somewhat more contemplative diversion, I suggest **Ishido** (★★★★; estimated street price, $30), from MacPlay (800-462-2752 or 714-553-6655). The board and playing pieces are beautiful, making Ishido refreshingly relaxing to play. The game itself is insidious — simple to learn but difficult to master. Each game teaches players something new about strategy and leaves them thinking, "I'll try just one more time."

For the Party Host

Who needs roasted chestnuts when you can gather everyone around the Mac for a rousing session of the new **Trivial Pursuit Interactive Multimedia Game** (★★★½; list price, $30) on CD-ROM? Yes, it's the hoary old board game, but Virgin/Parker Brothers (800-874-4607) has spiffed it up for the '90s by incorporating audio, video, and pictures. It's a blast from the past for up to six celebrants, and the new fast-play game provides all the fun of the original but in a lot less time.

If you or your party-hosting friend have the horsepower for it (a Quadra-class or PowerPC system), **Links Pro Macintosh** (★★★★½; list price, $70), an incredibly realistic golf simulation — on CD-ROM or floppy — from Access Software (800-800-4880 or 801-359-2900), lets you gather as many as eight buddies for some weather-impervious virtual golf. Here's the cool part: All eight of you can be at one Mac, or you can play over an AppleTalk network (just tell everyone the party is BYOP — bring your own PowerBook). Oh yeah, and with an AV Mac, you can use voice commands to choose your club and shot. FORE!

Kid Stuff

OK, I'm not one of MacUser's official "Two Dads," but I do have two kids who share their computer with lots of friends and neighbors. With luck, their tastes will be in sync with those of the kids you know.

Six-year-old Allison's friends tend to favor stuff with lots of click points — objects they can click on to make things happen. Among their most frequently played CD-ROMs are the ones (there are several) from Humongous Entertainment (800-499-8386 or 206-485-1212) that star the Putt-Putt and Fatty Bear characters — two faves are **Putt-Putt Joins the Parade** (★★★★★; estimated street price, $40) and **Fatty Bear's Birthday Surprise** (★★★★½; estimated street price, $40). Also high on their list are any of the Living Books, from Random House/Brøderbund (800-521-6263 or 415-382-7818), especially **Arthur's Teacher Troubles** (★★★★½; estimated street price, $40). Three-year-old Jacob hasn't quite got the hang of the mouse yet, but he still enjoys watching his sister play the Humongous and Living Books discs. In my humble opinion, you can't go wrong with either series for kids between 3 and 8.

A more constructive CD-ROM for prereaders would be **Reader Rabbit's Interactive Reading Journey** (★★★★; list price, $99), from The Learning Company (800-852-2255 or 510-792-2101). Allison fell in love with it last spring, played it through two separate times, and pretty much learned to read by summer.

In the Teen Spirit

If your favorite teenagers are into weaponry, aliens, and gore-strewn mayhem, by all means get them a copy of the greatest first-person deathfest yet: **Marathon** (★★★★★; estimated street price, $40), from Bungie Software (312-563-6200). Rumor has it that **Marathon 2** will be in stores by the time you read this; although I haven't seen it yet, it's probably a good choice as well.

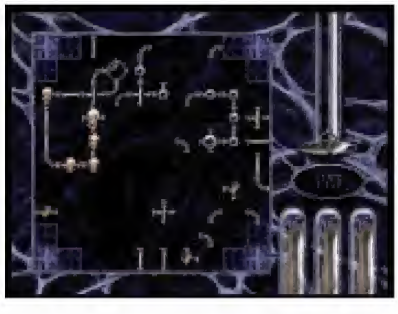
For a nonviolent gift that's also in tune with adolescent angst, try **Troubled Souls** ▶ (★★★★½; estimated street price, $30), a gothic arcade game from Varcon Systems (619-563-6700). Troubled Souls features gorgeous graphics, subtle music, and addictive game play. It requires a nimble mind as well as a deft hand, which makes it just right for those less pugnacious pubescent types.

For Everyone Else

If any of your remaining gift targets are sci-fi fans, try **Dark Forces** (★★★★½; estimated street price, $45), from LucasArts (415-721-3300). Players of this CD-ROM get to join the Rebel Alliance, infiltrate the Empire, and then battle every man and machine the Imperial Forces can muster. Fast and furious finger-twitching battles are interspersed with motion-video sequences to make for a compelling Marathon-meets-Darth-Vader sort of experience.

Got anyone left on your list? Whether they're Generation X'ers or Generation Ex-Lax'ers, I recommend **Loony Labyrinth** ▲ (★★★★½; list price, $60), the latest pinball simulation from StarPlay (800-203-2503 or 970-447-9562). Those old enough to remember playing real pinball machines will be amazed at how believable it is. It's just like the real thing, except that all the rollovers work all the time and there's no sticky Coke residue on the tabletop. You can even nudge the table to coerce the ball into going where you want it to (but be careful not to Tilt).

Bob LeVitus is undergoing treatment for game addiction. He is also director of evangelism for Power Computing.



JOHN C. DVORAK



The Applepaedia Britannica

I LOVE ANOMALIES — I'M ALWAYS looking for what's out of whack and trying to understand why — and the high-technology scene never disappoints me. Here's an anomaly that sticks out like a Mac at PC Expo: We live in an age where information is king and terms such as information superhighway are tossed around along with information at your fingertips and the regrettably unforgettable knowledge worker. How, then, can an information icon such as the Encyclopaedia Britannica be going down the tubes? After all, the Britannica embodies information.

On the surface, you could say it's because this venerable institution exemplifies an old medium floundering in a new age. That may be true, but how many other old-media outlets are dying so quickly? There has to be more to it than that! Besides, there's no new-media substitute for the Encyclopaedia Britannica.

It's probably a combination of societal and market variables that's hurting the Britannica. Its marketing is old-fashioned. Door-to-door sales, if you haven't noticed, are frowned upon nowadays. And the old-fashioned sales pitches probably don't help either.

Whatever the reason for its decline, the Encyclopaedia Britannica must move quickly to a new format and model. Suppose you could get something called the Multimedia Encyclopaedia Britannica (MMEB) on an affordable CD-ROM. Would you even consider the competition? I doubt it. The Britannica company has argued that the entire encyclopedia has to fit on one CD-ROM (who knows why that's the thinking?). So it created a text-only CD-ROM that sells for $995. Needless to say, sales haven't been brisk. Obviously the company simply doesn't get the picture.

Now how about this for an idea: Have Apple buy the Britannica operation and maintain it as a resource oriented toward home Mac users. To add value, Apple could make the encyclopedia real-time by turning eWorld into an information server to be used in conjunction with the MMEB CD-ROMs.

Bear in mind that if Apple doesn't do this, Microsoft will. Forbes magazine has been goading Microsoft to buy Britannica for some time now. Microsoft, in case you haven't noticed, has been buying into publishing houses and obtaining the digital rights to all sorts of stuff. Hang out in publishing circles, and you'll hear that Microsoft could be the world's biggest publisher of print and electronic media sometime after the year 2000.



Until now, Microsoft has concentrated its energies on grabbing rights to old material for repurposing on CD-ROM. But how long before Bill Gates sees a gold mine in the backlist at Simon & Schuster or Random House and starts making multibillion-dollar offers? It's reminiscent of Ted Turner buying old movie studios to get at the archives. There's gold in them thar hills. And the gold is now all the more valuable since Congress changed the copyright laws so fewer and fewer products fall into the public domain.

Both Apple and Microsoft are in a good position to make a move for Encyclopaedia Britannica. So are CompuServe, Prodigy, and America Online, although their combined infatuation with the Internet lessens the chances of their seeing this opportunity.

Here's how it would work: You sell a ten-disk CD-ROM system called the Multimedia Encyclopaedia Britannica. You can sell it stand-alone or as a complete computer system (an Apple advantage) or with a modem and an account on the Britannica online service (a part of eWorld, Microsoft Network, or whatever). The online service would be an intense information provider designed for basic research and as a children's homework helper. Prodigy has already demonstrated that an online homework helper can be a phenomenal success. For years we've heard predictions that there would be a convergence between CD-ROM technology and the online world. The MMEB could be the fuse to ignite a new market segment and begin that trend.

Of course, the current Britannica management is clueless. For example, it has made its database accessible on the Web via Time-Warner's Pathfinder. Unfortunately, it's a database-query engine — type in a word or phrase, and Britannica responds. I'm sorry, but database-query engines make for lame encyclopedia interfaces, and this one's no exception. Let's hope that now that the savvy Joe Esposito (formerly of every publishing house known to man) has taken the reins at Britannica, he will immediately ashcan the current $995 CD-ROM, shut down Britannica Online, and sell the whole operation to Apple or some other modern company with new ideas.

If the new home of Britannica were to be Apple, eWorld could really become a place worth visiting. As important, the intellectual tradition embodied in Britannica would live on. Hey Joe: Do it now.

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